Me, My Health and My Children's Health

Teachers' Guide

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Title	LifeLab: Me, My Health and My Children's Health

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LifeLab: Me, My Health and My Children's Health

The LifeLab teaching module and materials have been endorsed by the Royal College of Paediatrics and Child Health (RCPCH)

Me, My Health and My Children's Health
Foreword by
Professor Marcus Grace (LifeLab Director of Research, Southampton Education School) and
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The LifeLab module: Me, My Health and My Children's Health is a series of stimulating lessons integrated into the secondary science curriculum. The lessons cover both communicable diseases focusing on COVID-19, and non-communicable diseases (NCDs), which are increasingly common in our society today, including heart, lung and liver disease, stroke, and some forms of cancer. The module is research-informed both from a scientific and pedagogical perspective. There is increasing scientific evidence, much of it spearheaded by research at Southampton, that a healthy lifestyle at an early age can have profound consequences on our long-term health, and on the health of our future children – a message that we need to get across to teenagers before they have children of their own. The lessons are informed from science education research evidence on how we can best support students to learn science for everyday life, helping them develop their reasoning skills and decision-making. The innovative, student-centred lessons include a series of hands-on practical activities to build on lessons learnt during the module of work, and are followed by opportunities for students to take part in inquiry-based learning by designing, conducting and presenting the outcomes of their own health investigations. Our approach aligns with the Maintaining Curiosity report from Ofsted (November 2013) which sets out the rationale for a "better science education to secure a strong foundation for a successful and technological society" and is designed to promote 'teaching for engagement' as outlined in the Improving Secondary Science Guidance report (EEF, 2018).

Members of the LifeLab team were commissioned by the Department for Education to help write the new Science curriculum and GCSE criteria, and were part of the EEF's evidence review group that contributed towards the Improving Secondary Science Guidance report. LifeLab has input from Headteachers, the Science Learning Partnerships and Ofsted inspectors. One school was praised in its Ofsted report for taking part in LifeLab: 'A particularly successful workshop, 'LifeLab Southampton', is based at the local hospital and is making an important contribution to students' understanding of the need to adopt healthy lifestyles.' The learning materials have been successfully used with over eleven thousand pupils and their teachers. In a recent development funded by the National Institute for Health Research, attendance at LifeLab is forming part of a three component intervention to motivate and support teens to eat better and be more active, which also includes training teachers in Healthy Conversation Skills (see below) and offering young people a smartphone game to support them make and sustain changes to their eating and activity. This intervention called Engaging Adolescents in Changing their Behaviour (EACH-B), is currently being trialled in 50 schools in the Wessex region to test its effectiveness.

Behaviour Change Theory
Foreword by
Dr Wendy Lawrence (Associate Professor of Health Psychology, Faculty of Medicine, University of Southampton)

In order for students to get the maximum benefit from their LifeLab experience, the LifeLab educators adopt an empowering, student-led approach to teaching and learning. The aim is that students not only acquire knowledge about the links between lifestyle choices and their health, including in relation to COVID-19, but are also supported to make plans for improving their diets and lifestyles and thus reduce their own risk of NCDs in later life. In this way, there is potential for future populations to achieve better health outcomes for themselves and their offspring. The premise of identifying one's own solutions informs the underlying philosophy of "Healthy Conversation Skills", an approach to supporting change utilising a range of behaviour change techniques known to be effective in promoting and maintaining lifestyle changes. These techniques include goal-setting and review, self-monitoring, modelling and social support.

The LifeLab teaching package has been developed with these considerations in mind, and throughout the activities and lessons, where defined behaviour change techniques have been used, these are highlighted in the lesson plan. LifeLab educators trained in "Healthy Conversation Skills" are able to support students to explore and identify behaviours they wish to change, to pinpoint barriers to such changes, and to develop strategies for achieving change. At the end of their LifeLab experience, students are supported to use SMARTER (Specific, Measurable, Action-oriented, Realistic, Timed, Evaluated and Reviewed) planning to make a pledge to change a specific behaviour and a plan that will enable them to achieve their goal. In this way, small realistic steps towards change can be planned and reviewed with their school teachers in the classroom following the LifeLab Health Pledge activity.

Foreword

LIFELAB

The COVID-19 Pandemic
Foreword by
Dr Kathryn Woods-Townsend (LifeLab Director, Southampton
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One of LifeLab's main aims is to co-create with young people an environment to allow their voices to be heard, advocate for change and enable them to flourish, building resilience for a complex and changing world. Our programmes are designed to enable young people to engage with the science behind health messages and be empowered to take ownership of their own choices.

In March 2020, when our face-to-face work was halted as a result of the COVID-19 pandemic, we felt that there was an important need to apply our 'science for health literacy' programme to include a wider focus on health, encompassing communicable diseases, and in particular, COVID-19. This provided an opportunity to develop a module of work to address the unique challenges young people are living through. Providing knowledge and space for young people to discuss the impact of the pandemic on their lives, the focus on 'Working Scientifically' remains, with COVID-19 focused activities embedded throughout the module. For example, students are asked to consider how scientists collect health data and how these are used to draw conclusions using the Teens in COVID-19 study (TeC-19)[1], which aimed to explore how young people (aged 12-19 years) responded to government messaging, and how the restrictions affected their lives, wellbeing and health behaviours. Further, a new lesson has been designed on 'Identifying Misinformation'. This has been added to support students' ability to navigate through the many sources of information they encounter, especially through social media, and to be critical of the (mis)information they come across. The intention of this module is to enable students to consider their own health in a wider context, both from personal experience and using an evidence-based approach, to understand the impact that their decisions and behaviours can have on themselves personally, their families, and their wider communities.

[1]University of Southampton (2020). Real-time research aims to support 'lost and anxious' young people through COVID-19 pandemic, University of Southampton.

Key:

Developing Literacy skills		Assessment opportunity	
Developing Numeracy skills		Developing IT skills	
Developing Discussion skills		COVID-19 YHC	

Contents

LifeLab Science for Health Literacy Module

Part 1: Science Education for everyday life and LifeLab

Introduction

The LifeLab module focuses on science and health education. The health education focus is based on research on epigenetics, non-communicable diseases (e.g. heart, lung and liver disease), as well as communicable diseases, particularly COVID-19, and behavioural change in relation to health. The science education focus is on teaching the concepts of communicable and non-communicable diseases as well as on 'Working Scientifically' as outlined in the science curriculum. The areas of science and health education are brought together in a 'science for health literacy' module placing a emphasis on the nature and role of scientific evidence in developing scientific knowledge that relates to health, and on the ways that this evidence and knowledge can then be used in everyday life by young people, on the extent to which it can influence their health-related decision-making, and finally on the extent to which it can facilitate the adoption of healthy behaviours.

This part of the LifeLab Teachers' Guide starts with providing some key information on the nature and role of evidence in science, and then focuses on five aspects of teaching the LifeLab module, which we think are important to consider when implementing the module with your students. These five aspects are: a) having productive whole-class and small-group discussions, b) organising and managing student groupwork, c) organising and managing multiple soures of evidence, d) discussing sensitive issues with students, and finally e) using inquiry-based teaching and learning. For each aspect, we provide some thinking points for reflection, which aim at helping you consider your own teaching practice in relation to the pedagogical approaches that underpin the LifeLab module. We also provide additional resources in the form of research articles and/or relevant online resources you could follow-up with to inform your thinking and practice. All the research articles referenced are available in the Teachers' Guide and on the USB stick provided with the resources.

Evidence: a quick guide to the nature and role of evidence in science

Through our 'science for health literary' module, we want students to understand and experience what it means to be 'working scientifically'. Within this way of doing and thinking about science, the role of evidence is critical. Students should understand what evidence is, how it is produced, developed and used in different scientific disciplines, and the role it has in informing decisions and supporting ideas.

What is evidence: evidence is scientific data that links a claim or idea to a conclusion. Facts and scientific/empirical data on their own are not evidence; they become 'evidence' when they are considered in relation to an idea or claim.

Role of evidence in science: evidence can support or reject ideas, and help build scientific explanations.

How is evidence produced and used in science: there are different ways of producing empirical data that can be used as scientific evidence to support or reject explanations. There are various strategies for producing and collecting data in science, from hands-on experimentation or 'practical work', to running simulations and modelling of scientific phenomena. Evidence can also take the form of information provided from secondary data sources. When referring to the nature of evidence within science we usually refer to empirical data that are being collected through observation or measurement to confirm/reject a hypothesis, or to support/reject an idea. This means evidence can

come from qualitative data in the form of visual or textual data (e.g. from observing and understanding behaviours) or quantitative data in the form of numbers (e.g. measuring height and weight).

When considering how scientific evidence is used, and how strong the conclusions drawn from them are, we need to take into account:

a) the *quality* of the scientific evidence in hand (i.e. how was this evidence collected? Is it valid? Is it empirical evidence or just an opinion?)

b) the *sufficiency* of scientific evidence (i.e. do we have enough evidence to support our idea?)

c) the *appropriateness* or *relevancy* of scientific evidence (i.e. is the scientific evidence used by students directly linked to the ideas/conclusion or is it irrelevant?)

Decision Making and using evidence: In science education, it is often the case that students and young people will have to engage in decision-making about socioscientific issues (issues stemming from science with links to society) such as obesity, the coronavirus pandemic, human-made climate change, gene therapy etc. The use of evidence to support taking a position or making a decision is different in that students (and adults) will not just use scientific evidence, but will base these decisions on other considerations such as emotions, compassion, trust, and other types of informal reasoning (e.g. moral reasoning). This is how real-world decisions are made in everyday life. This means we need to allow space for such considerations and support students in using scientific evidence as well, so that their decisions are evidence informed.

Thinking points to reflect on

- Do you use the term 'evidence' in your teaching? Do you ask your students to use evidence to support their ideas?

- Do your students use it? In what ways?

- How could you make this more explicit in your discussions, explanations, questions during your science lessons in general as well as during the LifeLab lessons?

- Do you consider the social context of science concepts in your lessons? When do you usually do that?

- Do you engage your students in activities and discussions where they have to make decisions about themselves and actions based on what they are learning in science?

Additional Resources

Grace, M. (2009). Developing high quality decision - Making discussions about biological conservation in a normal classroom setting. *International Journal of Science Education,* 31(4), 551-570.

McNeill, K. L., & Krajcik, J. S. (2011). *Supporting Grade 5-8 Students in Constructing Explanations in Science: The Claim, Evidence, and Reasoning Framework for Talk and Writing.* Pearson.

Osborne, J., Donovan, B. M., Henderson, J. B., MacPherson, A. C., & Wild, A. (2016). *Arguing from evidence in middle school science: 24 activities for productive talk and deeper learning.* Thousand Oaks, California: Corwin Press.

Osborne, J., Erduran, S. & Simon, S. (2004).   *Ideas, Evidence and Argument in Science (IDEAS) Project.* King's College London. Available on the STEM Learning website: https://www.stem.org.uk/elibrary/collection/3308

Sadler, T. D., & Zeidler, D. L. (2005). Patterns of informal reasoning in the context of socioscientific decision making. *Journal of Research in Science Teaching, 42*(1), 112-138.

Zembal-Saul, C., McNeill, K. L., & Hershberger, K. (2013). *What's your evidence?: Engaging K-5 children in constructing explanations in science.* Pearson Higher Ed.

The **Research into Understanding Scientific Evidence** project at Durham University, goes more in depth on the nature and use of scientific evidence and how this is conceptualised by students, have a look at their work here: http://community.dur.ac.uk/rosalyn.roberts/Evidence/cofev.htm

Part 2: Teaching tips for LifeLab activities

As you go through the LifeLab Teachers' Guide and Student booklet, you will see that there are various discussion-based activities included, either in whole-class or in small groups, and a range of resources used as 'sources of evidence' in these activities. We provide some ideas and tips for you to consider as you prepare to use these activities with your students. We base this information on classroom-based research on how to use classroom talk to extend students' reasoning about, and understanding of, science concepts.

A. Having productive whole-class and small-group discussions

What research suggests about engaging productively in whole-class and small group discussions

When preparing to have whole-class discussions with your students, or when setting up group-work activities consider what is your role during this discussion, especially when asking questions, and what it is you are trying to achieve. Teacher questioning and follow-ups during discussions could have these aims:

- to scaffold and support learning

- to assess learning

- to challenge students' ideas

- to model the types of questions you would like your students to use (e.g. *Why? How do you know? What is the evidence? What is the scientific explanation?*)

A way to approach whole-class and small group evidence-based discussions in your science lessons, is to think how you can engage your students in the following three processes, or ways of talking, in order to get a sense of their conceptual understanding, and how to extend it or address misconceptions:

i. **constructing** ideas about the concepts taught or topics discussed

ii. **justifying** those ideas using evidence

iii. **evaluating/critiquing** their own and other students' ideas by engaging in comparing and contrasting tasks and thinking about 'best' possible explanations, justifications, conclusions based on evidence presented

Table 1 provides examples of questions you or your students could be using when engaging in evidence-based discussions, either in whole-class or during group-work activities. In addition to the examples of questions presented, research shows that asking students to **add onto** other students' answers/conclusions, say if they **agree or disagree** (and why) with other students and allowing for enough **wait time** between questions and answers creates accountability in your classrooms and supports students extending their reasoning (Gomez Zaccarelli et al., 2018; Michaels et al., 2008; Roth, 2014). Finally, a two-stage collaborative process where students first work in small groups and then have a whole-class discussion scaffolded by the teacher can further support the development of their decision-making and reasoning.

Table 1 (based on Christodoulou & Osborne, 2014; Michaels et al., 2008)

Construct ideas	Justify ideas	Evaluate/critique ideas
• What do you think… • Can you name/list… • Can you give a definition of.. • What do you see? • What do you mean by… • Can you tell us a little bit more about your idea… • How else/in what other ways • can we describe, explain… • Can you give me an example • of…? • So, do you think that...? • If …..then…..? • What if...?	• Why do you think that? • Can you give me a reason? • How do we know that…? • How did you arrive at that conclusion? • What led you to thinking that? • Can you explain your idea?	• Do you agree/disagree with thatidea? • Anyone that would like to argue against this idea? • Can you see any similarities/ differences between…? • Is it true/false that….? • What is the best way to….? • What about [suggest other ideas]? • Which is the best way based • on….? • Can someone add more to this?

Thinking points to reflect on

- Consider your role when asking questions during whole-class or small group discussions; why are you asking those questions?

- How long do you wait between asking a question and nominating a student to answer? Research suggests that waiting for 3 seconds or more allows students to provide more reasoned answers (Rowe, 1986); try to count to 10 before inviting a student to give an answer to your question

- Is your classroom 'questioning-friendly' (i.e. do your students feel safe in asking you, and their peers, questions that challenge thinking/understanding)? How can you make your students feel safe challenging each other's thinking?

Additional Resources

Christodoulou, A., & Osborne , J. (2014). The science classroom as a site of epistemic talk: A case study of a teacher's attempts to teach science based on argument. *Journal of Research in Science Teaching*, 51(10), 1275-1300.

Gomez Zaccarelli, F., Schindler, A. K., Borko, H., & Osborne, J. (2018). Learning from professional development: A case study of the challenges of enacting productive science discourse in the classroom. *Professional development in education,* 44(5), 721-737.

Michaels, S., O'Connor, C., & Resnick, L. (2008). Deliberative Discourse Idealized and Realized: Accountable Talk in the Classroom and in Civic Life. *Studies in Philosophy and Education,* 27(4), 283-297.

Rojas-Drummond, S., and Mercer N. (2003). Scaffolding the development of effective collaboration and learning. *International Journal of Educational research,* 39, 99-111.

Roth, K. J. (2014). Elementary science teaching. In N.G. Lederman & S.K. Abell (Eds). *Handbook of research on science education* Vol. 2, 361-394.

Rowe, M. B. (1986). Wait time: slowing down may be a way of speeding up!. *Journal of Teacher Education,* 37(1), 43-50.

The ***Teaching argumentation in the science classroom*** online CPD unit, funded by the Primary Science Teaching Trust (PSTT) offers a range of classroom-based resources to support secondary school students' reasoning and conceptual understanding through the use of evidence-based discussions (also known as argumentation): https://www.pstt-cpd.org.uk/ext/cpd/argumentation/index.php.

On this website, you can find examples of how teachers have asked students to explain their reasoning and ideas during science lessons.

STEM Learning (2008). Strategies for Progression and Rich Questions. Framework for Secondary Science. Available at: https://www.stem.org.uk/elibrary/resource/29847

B. Organising, and managing student groupwork during LifeLab lessons

At various points during the LifeLab activities you will be asked to have whole-group discussions or small groupwork discussions with your students. To organise effectively this process, we suggest you consider group composition in terms of a) attainment levels and b) social interaction skills. Mixed-attainment grouping can benefit students by allowing them to ask each other challenging questions, and to engage in peer support and explanation during the group activities. You should also consider the social interaction skills of your groups, and try to create groups that are used across lessons and activities, to reinforce group cohesion, that can further support productive engagement with the tasks given.

There are various strategies you can use to organise small group work including: talk partners (pair work), listening triads (groups of 3 each with a specific role: speaker, questioner, recorder, taking turns to perform these roles within groupwork tasks), pairs to fours, jigsaw method, think-pair-share etc. You can use these strategies to adapt some of the activities described in the unit, especially if you want students to work in smaller rather than large groups (e.g. in pairs rather than groups of 4-5).

Some points to consider when setting up and running groupwork activities

- Establish ground rules for talking, sharing and behaving within the group (Figure 1) before you ask students to take part in any groupwork activities

- Ensure that each student has a clear role for collaboration/behaviour within the group (e.g. in Lesson 2, Activity 1 and 4 you can assign roles such as the 'resources handler/manager', note-taker, spokesperson, group encourager'

- Ensure that students are aware of a clear objective, timeframe and final outcome for each activity (especially if you are adapting it in any way from those in the Student Booklet).

> - We share our ideas and listen to each other
>
> - We talk one at a time
>
> - We respect each other's opinions
>
> - We give reasons to explain our ideas
>
> - If we disagree, we ask '*why*?' and *how do you know?*
>
> - We try to agree in the end
>
> - If we don't understand we ask: *'can you explain that to me?'*

Figure 1: The Ground Rules for Talking developed and implemented by the Thinking Together Project (http://thinkingtogether.educ.cam.ac.uk/about/)

- Think in advance about what you will be doing while students are doing their group work; you could circulate around the groups and monitor discussions; use post-it notes to write down some of the points students raise, which you think are worth exploring further (or addressing) in whole class

- give groups question prompts that will keep them *focused* on task (i.e. the key question they are discussing), *support* the discussion (e.g. description & analysis questions, using examples) and that will *extent/challenge* them (e.g. comparing with previous knowledge/lessons, considering alternative views/playing devil's advocate).

- *Consensus vs. Persuasion:* Having to reach consensus within small group discussion has been found to produce significantly better-quality discussions between students compared with having to persuade each other. When trying to reach consensus (i.e. agree on one solution/answer), students used more evidence, and considered all alternatives before making a decision on which idea is better, or coming up with a solution of their own (Garcia-Mila et al., 2013). When students are asked to persuade others, they tend to use less evidence and repeat them significantly more rather than consider a wider range of evidence and ideas (Gilabert et al., 2013).

Thinking points to reflect on

- Do you use groupwork in your teaching? How do you organise your groups to help you transition from one activity to the next most effectively? Think about how to best organise

group composition and materials to help you switch easily from whole group, to pair talk, to groupwork, to whole group again

- Assign group roles that are understood clearly by students; you could create a poster of group roles and their definitions and keep it in your classroom, so students can refer to it. You might choose to assign students particular stakeholder roles (e.g. scientist, parent) that require them to engage in discussion and support a point they do not agree with; this will be challenging for many of them as you are asking students to engage in hypothetical scenarios that are distant from them/their views.

  - o Do students have enough information to use as evidence in these discussions? (if they don't and do not agree with the position, it's unlikely they will engage with the task).

  - o Do you allow time for students to consider what their view and decision is, in addition to considering a stakeholder position (that might be different to their own view)?

  - o Can your students negotiate ideas without being confrontational? How can you support them in learning to engage productively in such negotiation of ideas?

Additional Resources

Baines, E., Blatchford, P., & Kutnick, P. (2016). *Promoting effective group work in the primary classroom: A handbook for teachers and practitioners*. Routledge. [although focusing on primary education, this textbook is full of strategies, tasks and resources that can easily be adapted for teaching secondary science at KS3 and KS4].

Garcia-Mila, M., Gilabert, S., Erduran, S., & Felton, M. (2013). *The effect of argumentative task goal on the quality of argumentative discourse.* Science Education, 97(4), 497-523.

Gilabert, S., Garcia-Mila, M., & Felton, M. K. (2013). The effect of task instructions on students' use of repetition in argumentative discourse. *International Journal of Science Education,* 35(17), 2857-2878.

Herman, B.C. (2018) Students' environmental NOS views, compassion, intent, and action: Impact of place-based socioscientific issues instruction. *Journal of Research in Science Teaching* 55(4), 600–638.

The *Thinking Together* project based at the University of Cambridge, provides a range of resources on how to approach teaching and learning using discussion and groupwork: https://thinkingtogether.educ.cam.ac.uk/resources/

C. Organising, managing and using productively the multiple sources of evidence provided

Activities throughout the LifeLab module, will require students to spend time reading and evaluating information provided as 'sources of evidence' (either in print or given as websites and other electronic sources) so as to construct explanations or develop their understanding of health/science concepts. Some of the issues that might arise with these activities, and the handling of multiple sources of evidence within lessons will relate to your students' literacy skills, their ability to make correct and

relevant links between the questions they are trying to answer, or the conclusions they are trying to draw, and the information given to them, as well as the organisation of the wide range of resources that are being used. We suggest the following, as ways of supporting you with these activities:

- make sure you have gone through the evidence statements ahead of your lesson, and have identified how they match to each group, and how they could be used to answer questions in the booklet, or to support student discussion. For instance, can you identify evidence that could contradict some of your students' possible answers? How could you use this counter-evidence to extend their thinking/reasoning?

- organise each group's evidence statements into envelopes, and ensure you have a routine in place about how these materials are being handed out, used during the task, and returned at the end of the lesson (e.g. one student role within the group would be to have responsibility for these resources; you could have a corner or location in your class designated as a 'resources bank'; get a box made into an 'evidence box').

- allow time for students to familiarise themselves with the evidence statements, and consider how to facilitate this process with students whose literacy skills are lower (e.g. think about pairing students within groups; think about how to assign group roles that can support this familiarisation process; scanning text for keywords either identified by students, or given by you).

- have prompt questions printed out for students to use with each other, and to use as a reminder of the task's objective; use these prompts as additional scaffolds for discussion of the Booklet tasks/tables/instructions.

D. Discussing sensitive issues with students

Teachers can face the difficult situation of dealing with sensitive issues raised by students; this is not unusual when discussing topics like health and illness. This can be tough for your as a teacher to deal with but will be even tougher for students. It is important for you to recognise that you are significant adults in your students' lives. Students will often hear about current affairs at home, from peers or from the media. What is happening can be difficult for them to understand. This is made more difficult by the increase in 'fake news' on social media. Students need a safe space to have conversations that will reassure them.

Some strategies to support you in dealing with sensitive issues with students

There are some things you can do when teaching topics, which may touch on sensitive issues:

- **Be prepared**

  o   Identify potential topics in the LifeLab module that some students may find upsetting.

  o   If you think students may be particularly affected by certain issues, in advance of the discussion, you might let parents know the topics that will be covered. This allows parents to chat about these things at home as well.

  o   Undertake training available from mental health charities such as BEAT.

- **Create a safe space with boundaries**

  o   Be clear from the start that everyone has the right to an opinion but that hurtful or offensive comments will not be tolerated.

o   Make it clear that everyone should be given a voice without judgement but that students need to think about how their words will affect those around them.

o   You can also set up an anonymous question box as a way of encouraging students to ask questions they may feel embarrassed to ask in person.

o   Allow students the opportunity to leave the room without explanation or offer time to speak with you confidentially if they wish.

- Allow students to feel heard

    o   One of the most important things to do is to create a balance of views whilst respecting and acknowledging different arguments.

    o   Use open questions, that start specifically with 'How' and 'What' to invite students to share their views and to explore them. Where we would encourage you to ask students to ask 'why' to justify their reasoning when having discussions about science concepts, you should try to avoid using questions that start with 'Why' when students express their personal views as this can feel judgemental and make them feel put on the spot.

    o   Don't immediately shut down a problematic comment, instead use 'how' and 'what' questions to ask them to provide a deeper explanation of their thinking. This encourages them to challenge what they think and explore whether they really believe what they have said.

- Support students to think about best ways to cope

    o   Use 'how' and 'what' questions to ask what someone in the class might do if they are affected by the topic. Encourage students to generate ideas for different ways of coping, sources of support and steps they could take to overcome challenging situations.

    o   Identify potential sources of support that students can be directed to. For example, Young Minds and the eating disorder charity BEAT. Share what you know about these sources if students do not suggest them themselves.

    o   Tell students what sources of support they might have in school if they wanted support and how they might access this support.

Thinking points to reflect on

- What are sensitive topics that *you* find personally challenging to talk about? What is it specifically that makes you feel this way about talking about the topic? What could make it easier for you to talk about this topic with your students?

- What do you think makes it challenging for *students* to discuss sensitive topics? How might they feel about the topics that are being discussed? What could make it easier for them to think, and talk about these topics?

- How do you normally explore topics with students? How often do you use open questions and create space for students to explore a topic? What might the effects of this be when compared with more didactic forms of teaching?

Additional Resources

Black, C., Lawrence, W., Cradock, S., Ntani, G., Tinati, T., Jarman, M., … & Baird, J. (2014). Healthy conversation skills: increasing competence and confidence in front-line staff. *Public health nutrition,* 17(3), 700-707.

Tumanyan, M., & Huuki, T. (2020). Arts in working with youth on sensitive topics: A qualitative systematic review. *International Journal of education through art,* 16(3), 381-397.

Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and research in Education,* 7(2), 133-144.

The Young Minds Charity, supports children and young people with their mental health. You can access their Resources Library here: https://youngminds.org.uk/resources/

BEAT is the UK's eating disorder charity, offering a range of support and resources: https://www. beateatingdisorders.org.uk/

E. Using inquiry-based teaching and learning and LifeLab

Inquiry-based teaching and learning is an integral part of the LifeLab activities, both in terms of the inquiring attitude that we wish students to develop within their science lessons, as well as being able to engage in inquiry-based activities, as outlined in the 'Working Scientifically' component of the Science Curriculum. Lessons 6-8 are designed to support students in this inquiry process, by enabling them to design, carry out and evaluate their own investigations about an investigative question of their own choice, with the teacher's support and guidance. 'Investigations' within inquiry-based learning, does not only mean 'practical work'. Students' inquiries can take the form of analysing secondary data for instance, or searching for patterns and engaging in classification tasks. There are different levels to inquiry-based learning, mainly differentiated by the level of support and scaffolding that the teacher provides to students during their investigations (Table 2). Teacher support will vary depending on the context, topic taught, and attainment levels of students.

Table 2: Levels of inquiry based on amount of support given by teachers (Banchi & Bell, 2008, p.26)

Inquiry level	Question	Procedure	Answer
Confirmation Inquiry *Students confirm a principle or answer through an activity given to them, where the results are known in advance*	✓	✓	✓
Structured Inquiry *Students investigate a question given to them based on the same process, which is also provided by the teacher*	✓	✓	
GuidedInquiry *Students investigate a question given by the teacher, but devise their own procedure*	✓		
Open Inquiry *Students investigate a question they formulate, and design their own investigations to answer it*			

LifeLab Science for Health Literacy Module

When inquiry-based learning activities and investigations focus on a socio-scientific issue, then students engage in socially responsible inquiries as the outcomes of their learning can support societal issues, and issues that are personally-relevant to them (e.g. healthy lifestyles). A key aspect of this approach, which is also emphasised in the LifeLab unit, is enabling students to act as a result of their learning (e.g. making changes to their lifestyles to be healthier). The types of inquiry we expect students to conduct based on the activities included in the student booklet vary between guided and open inquiries, but in both cases, we expect students to be supported by teachers through scaffolding (e.g. checking student progress, confirming investigation questions, ways of presenting data etc.). If you think this is going to be challenging for your students, then you can adapt the investigations to more structured inquiries and further scaffolding.

Thinking points to reflect on

- What are your own views on inquiry? Is this an approach you use normally? What kind of affordances does inquiry offer for you as a science teacher, and to your students?

- When do you think it's more appropriate and/or relevant to use inquiry-based learning activities in your teaching?

- How can you support students to *make judgments* based on both scientific evidence and ethical/moral implications?

- Do you include opportunities for students to consider and take action on issues based on concepts taught?

Additional Resources

Amos, R. & Christodoulou, A. (2018). Really Working Scientifically: strategies for engaging students with socio-scientific inquiry-based learning. *School Science Review*, 100 (371), 59-65.

Banchi, H., & Bell, R. (2008). The many levels of inquiry. *Science and children,* 46(2), 26

Furtak, E. M., Seidel, T., Iverson, H., & Briggs, D. C. (2012). Experimental and Quasi-Experimental Studies of Inquiry-Based Science Teaching: A Meta-Analysis. *Review of Educational Research,* 82(3), 300–329. doi:10.3102/0034654312457206

Minner, D. D., Levy, A. J. and Century, J. (2010). Inquiry-based science instruction—what is it and does it matter? Results from a research synthesis years 1984 to 2002. *Journal of Research in Science Teaching,* 47(4), 474–496

The Promoting Attainment of Responsible Research and Innovation in Science Education (PARRISE) developed a framework for teaching socioscientific inquiry-based learning (SSIBL) based on three steps: Ask, Find out, Act. You can find resources for using SSIBL with secondary school students and teacher support materials here: https://www.parrise.eu/wp-content/uploads/2018/04/parrise-en-rgb.pdf

A special issue in School Science Review from the work on SSIBL is available here: https://www.ase.org.uk/resources/school-science-review/issue-371

Links to External Agencies

In order to maximise the benefit of participating in the LifeLab programme for both teachers and students, we have explored ways to add value to the teaching activities in the modules.

We have worked with external agencies to ensure that it is as easy as possible for teachers to engage with the different opportunities and to ensure that students gain as much as possible from the experience.

British Science Association CREST awards

The CREST awards are a national award programme designed to recognise the effort which students put into their independent science study. These awards can be credited to the different stages of the Duke of Edinburgh award scheme, and are also recognised on UCAS forms.

We have worked with BSA to ensure that the work which the students do for their science investigations is of a standard required for the Bronze level award.

All students whose posters are selected for presentation at the annual LifeLab Schools' Showcase will automatically be awarded a Bronze award at the showcase event. It is possible for all students who produce science investigations to the required standard to gain these awards.
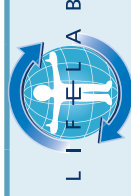
COVID-19 Young Health Champions

As part of the module, learners will have the opportunity to go on to complete an Ofqual-regulated Level 2 qualification, developed by the Royal Society for Public Health (RSPH) for use with this project. This will provide learners with the opportunity to gain an understanding of the measures in place to prevent transmission of COVID-19, and to design and deliver a campaign to raise awareness of the importance of these measures amongst their peers.

Where LifeLab supports the Gatsby Benchmarks January 2020

Gatsby Benchmarks 2019	LifeLab module day visit to SGH	Meet the Scientist STEM Ambassador	LifeLab ambassador	Medics summer school	Work experience
Benchmark 3: Addressing the needs of each student Pupils have different career guidance needs at different stages. Opportunities for advice and support need to be tailored to the needs of each pupil. A school's careers programme should embed equality and diversity considerations throughout. • A school's careers programme should actively seek to challenge stereotypical thinking and raise aspirations.	✓	✓			
Benchmark 4: Linking curriculum learning to careers All teachers should link curriculum learning with careers. STEM subject teachers should highlight the relevance of STEM subjects for a wide range of future career paths. • By the age of 14, every pupil should have had the opportunity to learn how the different STEM subjects help people to gain entry to, and be more effective workers within, a wide range of careers.	✓	✓			
Benchmark 5: Encounters with employers and employees Every pupil should have multiple opportunities to learn from employers about work, employment and the skills that are valued in the workplace. This can be through a range of enrichment activities including visiting speakers, mentoring and enterprise schemes. • Every year, from the age of 11, pupils should participate in at least one meaningful encounter* with an employer. * A 'meaningful' encounter is one in which the student has an opportunity to learn about what work is like or what it takes to be successful in the workplace.	✓	✓	✓	✓	✓
Benchmark 6: Experiences of workplaces Every pupil should have first-hand experiences* of the workplace through work visits, work shadowing and/or work experience to help their exploration of career opportunities, and expand their networks. • By the age of 16, every pupil should have had at least one experience of a workplace, additional to any part-time jobs they may have. • By the age of 18, every pupil should have had one further such experience, additional to any part-time jobs they may have. * As far as is possible, schools and employers should ensure these are positive experiences.			✓	✓	✓ ✓
Benchmark 7: Encounters with further and higher education All pupils should understand the full range of learning opportunities that are available to them. This includes both academic and vocational routes and learning in schools, colleges, universities and in the workplace. • By the age of 16, every pupil should have had a meaningful encounter* with providers of the full range of learning opportunities, including Sixth Forms, colleges, universities and apprenticeship providers. This should include the opportunity to meet both staff and pupils. • By the age of 18, all pupils who are considering applying for university should have had at least two visits to universities to meet staff and pupils. * A 'meaningful' encounter is one in which the student has an opportunity to explore what it's like to learn in that environment.	✓	✓	✓	✓	✓ ✓

Where LifeLab fits within the new Ofsted framework January 2020

	The Quality of Education	Grade Descriptors for 'Good' and 'Outstanding'	LifeLab Examples
172	The school's curriculum is rooted in the solid consensus of the school's leaders about the knowledge and skills that pupils need in order to take advantage of opportunities, responsibilities and experiences of later life. In this way, it can powerfully address social disadvantage.	**Intent:** • Leaders adopt or construct a curriculum that is ambitious and designed to give all pupils, particularly disadvantaged pupils and including pupils with SEND, the knowledge and cultural capital they need to succeed in life. • Pupils study the full curriculum; it is not narrowed. In secondary schools, the school teaches a broad range of subjects (exemplified by the national curriculum) throughout Years 7 to 9. **Implementation:** • Teachers have good knowledge of the subject(s) and courses they teach. Leaders provide effective support for those teaching outside their main areas of expertise.	• The LifeLab module engages pupils with staff from the University Southampton and Southampton University Hospital, the content is linked to research, helping to develop teenagers healthy lifestyle habits for their future health. Fully inclusive to all pupils. • Curriculum links highlighted within the LifeLab module to the National Curriculum in Science, PSHE, PE and Food technology. • Additional cross-curricular lessons provided to capitalise on providing teaching opportunities across different subject areas.
176	Our research has shown that some schools narrow the curriculum available to pupils, particularly in key stages 2 and 3. Our research also shows that this has a disproportionately negative effect on the most disadvantaged pupils. In secondary education, inspectors will expect to see a broad, rich curriculum. Inspectors will be particularly alert to signs of narrowing in the key stage 2 and 3 curriculums. If a school has shortened key stage 3, inspectors will look to see that the school has made provision to ensure that pupils still have the opportunity to study a broad range of subjects, commensurate with the national curriculum, in Years 7 to 9.		
179	Inspectors will draw evidence about leaders' curriculum intent principally from discussion with senior and subject leaders. Inspectors will explore: • whether leaders are following the national curriculum and basic curriculum or, in academies, a curriculum of similar breath and ambition • how carefully leaders have thought about what end points the curriculum is building towards, what pupils will be able to know and do at those end points, and how leaders have planned the curriculum accordingly. This includes considering how the intended curriculum will address social disadvantage by addressing gaps in pupils' knowledge and skills. • how leaders have ensured that the subject curriculum contains content that has been identified as most useful, and ensured that this content is taught in a logical progression, systematically and explicitly enough for all pupils to acquire the intended knowledge and skills.	• Teachers present subject matter clearly, promoting appropriate discussion about the subject matter being taught. • Teachers create an environment that focuses on pupils. The textbooks and other teaching materials that teachers select – in a way that does not create unnecessary workload for staff – reflect the school's ambitious intentions for the course of study. These materials clearly support the intent of a coherently planned curriculum, sequenced towards cumulatively sufficient knowledge and skills for future learning and employment.	• Teacher training and support provided prior to delivering the LifeLab module with the LifeLab Professional Development training day and online teacher training resources, including developing healthy conversation skills. Fully resourced teachers guide provided. • Detailed lesson plans and resources supplied to support teaching, with opportunities for discussion highlighted. • Individual LifeLab booklets supplied for each pupil. Fully resourced module provided with clear links to areas of the curriculum highlighted, including STEM opportunities and links to the Gatsby Benchmarks.

Where LifeLab fits within the new Ofsted framework Sept 2019

	Personal Development	Grade Descriptors for 'Good' and 'Outstanding'	LifeLab Examples
218	This judgement focuses on the dimensions of the personal development of pupils that our education system has agreed, either by consensus or statute, are the most significant. These are: • developing pupils' confidence, resilience and knowledge so that they can keep themselves mentally healthy • enabling pupils to recognise online and offline risks to their well-being – for example, risks from criminal and sexual exploitation, domestic abuse, female genital mutilation, forced marriage, substance misuse, gang activity, radicalisation and extremism – and making them aware of the support available to them • developing pupils' understanding of how to keep physically healthy, eat healthily and maintain an active lifestyle, including giving ample opportunities for pupils to be active during the school day and through extra-curricular activities • developing pupils' age-appropriate understanding of healthy relationships through appropriate relationship and sex education. • providing an effective careers programme in line with the government's statutory guidance on careers advice that offers pupils: - unbiased careers advice - experience of work, and - contact with employers to encourage pupils to aspire, make good choices and understand what they need to do to reach and succeed in the careers to which they aspire	• The school consistently promotes the extensive personal development of pupils. The school goes beyond the expected, so that pupils have access to a wide, rich set of experiences. Opportunities for pupils to develop their talents and interests are of exceptional quality. • The curriculum extends beyond the academic, vocational or technical and provides for pupils' broader development. The school's work to enhance pupils' spiritual, moral, social and cultural development is of a high quality. • The school provides high-quality pastoral support. Pupils know how to eat healthily, maintain an active lifestyle and keep physically and mentally healthy. They have an age-appropriate understanding of healthy relationships. • Secondary schools prepare pupils for future success in education, employment or training. They use the Gatsby Benchmarks to develop and improve their careers provision and enable a range of education and training providers to speak to pupils in Years 8 to 13. All pupils receive unbiased information about potential next steps and high-quality careers guidance. The school provides good quality, meaningful opportunities for pupils to encounter the world of work.	• LifeLab offers pupils a unique opportunity to visit a working hospital and interact with research scientists. The teaching resources and materials have been written with support and endorsed by clinical experts in their fields. There are further opportunities for pupils to extend their interest through LifeLab Ambassadors, Young Health Champions, Medical Summer School and work experience placements at Southampton General Hospital. • The LifeLab module builds upon areas of the Science, PSHE, PE and food technology curriculum, putting the curriculum into real life context for pupils. • The LifeLab programme focuses pupils on making healthy lifestyle choices for themselves to reduce their own health risks. The ethos of the programme is in ensuring pupils have the knowledge and skills to know what healthy lifestyle choices are and the self-efficacy to make them. • Clear links to STEM areas of the curriculum highlighted, including links to the Gatsby Benchmarks. During the Meet the Scientist session on the LifeLab visit – pupils engage with individual research scientists working at the University and Hospital. There are opportunities for pupils to engage further with staff at Southampton General Hospital, apply for work experience placements and attending the LifeLab Medics summer school.
224	From September 2019, schools are able to follow a new relationships and sex education and health education curriculum. From September 2020, they will be required by law to follow it. Primary-age children must be taught about positive relationships and respect for others, and how these are linked to promoting good mental health and well-being. In addition, sex education will become mandatory at secondary level.		

Where LifeLab fits within the new Ofsted framework Sept 2019

	Leadership and management	Grade Descriptors for 'Good' and 'Outstanding'	LifeLab Examples
229	The leadership and management judgement is about how leaders, managers and those responsible for governance ensure that the education that the school provides has a positive impact on all its pupils. It focuses on the areas where inspection and research indicate that leaders and managers can have the strongest effect on the quality of the education provided by the school. Important factors include: • whether continuing professional development for teachers and staff is aligned with the curriculum, and the extent to which this develops teachers' content knowledge and teaching content knowledge over time, so that they are able to deliver better teaching for pupils • whether leaders seek to engage parents and their community thoughtfully and positively in a way that supports pupils' education.	• Leaders ensure that teachers recieve focused and highly effective professional development. Teachers' subject, pedagogical and pedagogical content knowledge consistently build and develop over time. This consistently translates into improvements in the teaching of the curriculum. • Leaders have a clear and ambitious vision for providing high-quality education to all pupils. This is realised through strong, shared values, policies and practice. • Leaders focus on improving teachers' subject, pedagogical and pedagogical content knowledge in order to enhance the teaching of the curriculum and the appropriate use of assessment. The practice and subject knowledge of staff, including newly qualified teachers, build and improve over time. • Leaders engage effectively with pupils and others in their community, including, when relevant, parents, employers and local services. Engagement opportunities are focused and purposive.	• Bespoke teacher training and support provided prior to delivering the LifeLab module with the LifeLab Professional Development training day and online teacher training resources to further support teachers back in school. • Focus on developing teachers healthy conversation skills through open ended questioning and listening skills. Fully resourced teachers' guide provided, with assessment opportunities highlighted. • Teachers have the opportunity to engage with research scientists/STEM Ambassadors, exposing them to real life applications of science and giving them an insight current scientific developments. • During the LifeLab programme, pupils engage with research scientists working at the University and Hospital, and have opportunities to engage with local support agencies and services for young people and guest speakers etc.

Curriculum Links

L I F E L A B

Safety issues
Potential sensitivity to health issues and personal experiences of COVID-19

KS3 Science Programme of Study (DfE National Curriculum PoS)	KS4 GCSE Science Programme of Study (DfE National Curriculum PoS)
Scientific attitudes • pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility • understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review • evaluate risks **Experimental skills and investigations** • select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent and control variables, where appropriate	**Development of Scientific thinking** • the ways in which methods and theories develop over time • using a variety of concepts and models to develop scientific explanations and understanding • appreciating the power and limitations of science and considering ethical issues which may arise • explaining every day and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments • recognising the importance of peer review of results and of communication of results to a range of audiences **Experimental skills and strategies** • use scientific theories and explanations to develop hypotheses • plan experiments to make observations, test hypotheses or explore phenomena

KS4 GCSE Biology subject content
(DfE National Curriculum PoS)

Health, disease and the development of medicines
• the relationship between health and disease
• communicable diseases
• viruses as pathogens in animals
• body defences against pathogens and the role of the immune system against disease
• reducing and preventing the spread of infectious diseases in animals
• the process of discovery and development of new medicines
• the impact of lifestyle factors on the incidence of non-communicable diseases

PSHE
(DfE National Curriculum PoS)

Health and prevention
• about personal hygiene, germs including viruses, how they are spread, treatment and prevention of infection
• the facts and science relating to immunisation and vaccination

Behaviour Change Theory links

BCT 5.1   Information about health consequences
BCT 5.2   Salience of consequences
BCT 5.3   Information about social and environmental consequences
BCT 9.1   Credible source
BCT 9.2   Pros and cons
BCT 9.3   Comparative imagining of future outcomes

Objectives

At the end of this lesson students should be able to:
- Recognise the role scientists played in the COVID-19 pandemic
- Describe how scientists conduct trials to develop new treatments
- Identify the advantages of taking part in scientific research

Hook

Watch the video clip from the film Contagion filmed in 2011.
'How many of the terms do you recognise? Should we have been better prepared?'

Activities:

!! This lesson covers some sensitive issues and you may want to discuss these with students at the start, see 'Discussing sensitive issues' in the Teaching Tips on p.12. Introduce the lesson and share the objectives with the students. Individuals record how confident they are for each of the objectives at the start of the lesson.

### Lesson 1
Current Health issues

Activity1: Where do you stand on current health issues?

Read the following statements and decide how much you agree or disagree with each. Position yourself on the class line and fill in the scales below.

1. **All unhealthy food outlets should be banned within one mile of schools.**

Agree ————————————— Disagree

2. **It is suggested the production of meat is causing more greenhouse gases which harm the planet. Meat eating is killing our planet.**

Agree ————————————— Disagree

3. **The COVID-19 vaccine should be made compulsory for everyone**

Agree ————————————— Disagree

Activity 2: How would you define health?
What is the World Health Organisation (WHO) definition of health?

What is significant about this definition?

8

Starter

Activity 1: Where do you stand on current health issues?

Time: 5 minutes

The belief axis is a discussion tool for exploring the students' ideas on current health issues in the community.
- Mark out an agree/disagree line across the classroom.
- Pick one of the statements and ask the students to position themselves on the line depending on how much they agree or disagree with the statement.
- Class discussion justifying their position and opinions, *'What is the reason for your position?' 'What evidence do you have to support your view?' 'Where can we find this kind of evidence?'*
- Students can record their opinion on the scales in the yellow activity 2 box.

Activity 2: How would you define health?

Time: 5 minutes

Students write their own definition for health. Share with students the World Health Organisation's definition **'Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity**.' The World Health Organisation (WHO) is a specialised agency responsible for international public health around the world and advise countries on all areas of health.

Using the powerpoint students compare how well their definition fits with the WHO definition and discuss their results and identify what is significant about the WHO definition. The key point to make is 'Health' is a broad term that covers lots of different things, but the WHO definition is holistic, taking into account mental and social factors, rather than just the symptoms of a disease.

How Scientists Work

LIFELAB

Main

Activity 3: What role did science and research play in the COVID-19 pandemic?

Time: 15 minutes

Science and research has played a vital role in the pandemic. But what actually is COVID-19? Introduce the facts about COVID-19 to the students; there are lots of different coronaviruses that cause illnesses from the common cold to more severe respiratory diseases. COVID-19 is the illness caused by one particular coronavirus which can make some people severely ill. Scientists think it originated in animals, possibly bats or pangolins, and was passed to humans when they came into close contact with the infected animals. These types of diseases are called zoonotic diseases. Because the Sars CoV2 was a new virus, we had no immunity, medicines or vaccines ready to treat it.

Highlighting through scientific research what we know about the virus has dramatically increased throughout the year and we are still learning. Using the PowerPoint explore the timeline of the first 12 months of the COVID-19 pandemic with the students, identifying some of the key ways in which science and research have played a part in the pandemic. By clicking on the different events you will find out more information via the hyperlinks.

Lesson 1
What is COVID-19?
LIFELAB

Where did it come from? How does it spread?

What can I do to reduce my risk from the virus?

Science has played an important role during the pandemic in finding the answers to many of these questions, coming up with solutions to the problems, and in developing new equipment, tests, treatments and medicines.

Coronaviruses are a group of viruses that cause illnesses ranging from the common cold to more severe respiratory diseases. COVID-19 is the illness caused by one particular coronavirus called SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), but to reduce communication errors, the WHO calls it "the virus responsible for COVID-19".

Timeline for the first 12 months of the COVID-19 pandemic:

December 2019 — COVID-19 Identified and named — First recorded death in the UK — First lockdown Schools closed — Human vaccine trials begin — Quarantine restrictions for travellers introduced — Saliva testing pilot started — COVID-19 NHS App launched — 3 Tier restrictions introduced — First vaccination given — December 2020

First patients show symptoms in Wuhan China — First reported cases in the UK — WHO declares global pandemic — Occupancy of hospital critical care beds peaks — Test and trace started — Dexamethasone treatment made available in NHS — Face coverings compulsory in shops — New faster spreading variant detected — Second lockdown

Activity 3: What role did science and research play in the COVID-19 pandemic?
Discuss as many examples of the ways you can think of that the scientists were involved.

9

Lesson 1
How can we take part in Scientific Research?
LIFELAB

Activity 4: Vaccines and trials
All new treatments' have to be tested in clinical trials.
Meet Dr Alasdair Munro who is working on a new COVID-19 vaccine and Ruth who volunteered to take part in the trial.
There are strict criteria for people who want to volunteer to take part in clinical trials. Look at the case studies from people applying to take part in a trial to test for a new vaccine, who would you choose to take part and why?

Candidate	rejected or accepted	Reasons why

Activity 5: Could you participate in scientific research?
Most people engage with scientific research through news headlines, social media and some as patients through clinical trials.
This is called PPI (Patient and Public Involvement)

How do you think the views of young people can help the research being carried out?

How could young people benefit from taking part?

What might put young people off taking part?

Have any of your family taken part in scientific research?

Find out more about clinical trials and research in Southampton at:
www.uhs.nhs.uk/Research/Research.aspx

Homework task: Ready for the next lesson, photograph or write down everything you eat in one day and take a photo showing the inside of your fridge.

10

Main

Introduce students to vaccines and the role they can play in the pandemic.
Normally developing a vaccine is a slow process, taking around 10 years to completely develop a new vaccine from scratch. The COVID-19 vaccine was able to be developed in 10 months because there was previous research available from past viral outbreaks, governments around the world pledged funding and scientists collaborated globally to make it happen. The trial phases and manufacturing happened simultaneously, which would normally take years and happen one after the other. There has been as much data collected as in any other trials, so safety hasn't been compromised.

Main

Activity 4: How do we develop new vaccines?

Time: 25 minutes

All new treatments and medicines have to be tested in clinical trials and there are strict criteria for people who want to volunteer to take part in any trial. Using the new Oxford-AstraZeneca COVID-19 vaccine as a case study, watch the short video clips to meet Dr Alasdair Munro who is working on a new COVID-19 vaccine and Ruth who, volunteered to take part as a participant for the new vaccine trials, to find more about their role in developing the new Oxford-AstraZeneca vaccine.

There are strict citeria for people who want to volunteer to take part in any clinical trials. Students imagine they are part of the selection team and it's their job to identify who is and isn't suitable to take part in the trial. Using the evidence from the completed questionnaires from people applying to take part in the vaccine trial, and the information sheet about the trial, students assess and select who they would reject or include in the trial and explain their reasons why.

Plenary

Activity 5: Could you participate in scientific research?

Time: 5 minutes

Introducing students to Patient and Public Involvement (PPI). Discuss:
'How would you feel about taking part in a scientific research study?'
'How do you think the views of young people can help?'
'What are the benefits to young people taking part?'
'What might put people off from taking part?'
'Would you take part?'
PPI is very important to research, most funders will not fund projects unless they can see how the views and input of patients and the public will be included. The hospital and university are always looking for people who want to help shape research (students, families, teachers). The link for more information on clinical trials and research at Southampton is: www.uhs.nhs.uk/Research/Research.aspx

If time allows revist the belief axis stament in Activity 1 and see if the students have changed their view points. Students refer back to the lesson objectives and complete the assessment for learning activity in the orange boxes, feedback and share an interesting fact they have found out from the lesson.

Homework

In preparation for the next lesson ask students to record everything they eat for one day, either written or photograph. Potential here for parental participation and involvement, considering the diet of the family.

Resources

- Lesson 1 PowerPoint slides
- Student booklet pages 7-10
- Case studies of potential vaccine trial participants

Keywords

- virus
- pandemic
- zoonotic
- vaccine
- clinical trial

Safety issues
Potential sensitivity relating to their own diets

KS3 Science Programme of Study (DfE National Curriculum PoS)	KS4 GCSE Science Programme of Study (DfE National Curriculum PoS)
Scientific attitudes • pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility • understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review • evaluate risks **Experimental skills and investigations** • ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience • make predictions using scientific knowledge and understanding • select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent and control variables, where appropriate • make and record observations and measurements using a range of different methods for different investigations; and evaluate the reliability of methods and suggest possible improvements • apply sampling techniques **Analysis and evaluation** • present observations and data using appropriate methods, including tables and graphs • interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions	**Development of Scientific thinking** • the ways in which methods and theories develop over time • evaluate methods and suggest possible improvements and further investigations **Experimental skills and strategies** • use scientific theories and explanations to develop hypotheses • plan experiments to make observations, test hypotheses or explore phenomena • applying knowledge of a range of techniques, apparatus, and materials to select those appropriate for fieldwork and for experiments • making and recording observations and measurements • evaluating methods and suggesting possible improvements and further investigations **Analysis and evaluation** • translating data from one form to another • interpret observations and data, including identifying patterns and trends, make inferences and draw conclusions
	KS4 GCSE Biology subject content (DfE National Curriculum PoS)
	Health, disease and the development of medicines • the impact of lifestyle factors on the incidence of non-communicable diseases
KS3 Biology subject content (DfE National Curriculum PoS)	**KS4 GCSE Food preparation and nutrition (DfE National Curriculum PoS)**
Nutrition and digestion • content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, dietary fibre and water, and why each is needed • calculations of energy requirements in a healthy daily diet • the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases	**Nutrition** • recommended guidelines for a healthy diet • the recommended energy provided by protein, fat and carbohydrates (starch, sugars, fibre) and the percentage of daily energy intake the nutrients should contribute • how to calculate energy and nutritional values and plan recipes, meals and diets accordingly **Food choice** • how to make informed choices about food and drink to achieve a varied and balanced diet

PSHE
(DfE National Curriculum PoS)

Healthy eating
- what constitutes a healthy diet (including understanding calories and other nutritional content).
- the characteristics of a poor diet and risks associated with unhealthy eating (including, for example, obesity and tooth decay) and other behaviours (e.g. the impact of alcohol on diet or health).
- how to maintain healthy eating and the links between a poor diet and health risks, including tooth decay and cancer.

Behaviour Change Theory links

BCT 1.1   Goal setting (behaviour)
BCT 1.2   Problem solving
BCT 1.8   Behavioural contract
BCT 1.9   Commitment
BCT 2.3   Self-monitoring of behaviour
BCT 6.2   Social comparison

Objectives

At the end of this lesson students should be able to:
- Compare methods scientists use to study health in our communities
- Describe the types of evidence different data sources can give us
- Evaluate their own diet

Hook

How can we collect health data?
Students think of as many different methods/ sources which could be used to collect health data that they can come up with, e.g. Food diaries, questionnaires, body measurements, fitness/activity trackers, apps, monitors, fridge/ food cupboard photos

Activities:

Introduce the lesson and share the objectives with the students. Individuals record how confident they are for each of the objectives at the start of the lesson.

Lesson 2
Looking at Scientific Research Studies
L I F E L A B

UKTeC-19
TEENS AND COVID-19

The TeC-19 study carried out research into understanding the experiences of and the impact the COVID-19 restrictions had on teenagers and how they could be better supported during the pandemic.

The Southampton Women's Survey is a study learning about how diet and lifestyle factors influence the health and wellbeing of women and their children.

Activity 1: Comparing scientific research studies
Working in small groups, use the sources of information to answer the questions in the table opposite for your case study, either the Southampton Women's Survey or TeC-19. Share your information within your group so you can complete the questions for both studies.

Starter

Looking at scientific research studies

Time: 15 minutes

Students look at two case studies modelling how scientists carry out scientific and social research, *'What are the aims of the research? Who does it involve? How do they collect the data? What types of data do they collect?'*
Introduce the two studies; the Southampton Women's Survey (SWS) and the TeC-19 study.
Split the students into groups, each group uses the resources provided to look at one research study in detail and complete the summary sheet. A SWS Newsletter and TeC-19 resources are provided in the teacher's resource pack.

Note the website for the SWS study, for those students who want to find out more information, is in the newsletter.

Main

Activity 1: Comparing scientific research studies

Time: 10 minutes

Students share their findings to compare the two different studies and describe the differences between the different methods and types of information that was collected to measure health *'What are the different methods used to collect information to measure health? How does the different information help draw conclusions about health?'*
A key point to draw out is how research scientists work, looking at data and using it as evidence, recognising patterns and formulating new research questions. Even with SWS - researchers are going back to the data to ask new questions to those which they planned out at the start, and involves collecting different data.
What types of information do the different sources give us?
Research scientists use different methods to collect data from different sources. Discuss and highlight the main differences *'What is the difference between information collected in numbers* (quantitative data) *and the information collected in words* (qualitative data)?' Students describe and give some examples for each e.g. number = height and weight, text = focus group discussion.

How can we eat well to support our health and immune system?

Activity 2: "My Eatwell Guide"
As part of both studies the scientists asked participants to keep food diaries. Using your food diary or meal photos, input your data into the Excel spreadsheet.

A. Fill in the Excel spread sheet
- Open the spreadsheet called "My Eatwell Guide" and save it under your name
- Open the spreadsheet tab at the bottom of the page "What's in my diet". Use your food diary to enter the information into the green boxes
- Count each time you have written an item of food as '1' portion, except for milk where 1 portion = a glass of milk or 1 serving of a bowl of cereal
- As you enter your information, the spreadsheet will calculate how many portions of each food group you have eaten
- Once you have entered all the information, click on the spreadsheet tab "My Eatwell Guide"
- This pie-chart will show you how similar your Eatwell Guide is to the official Eatwell Guide

B. What does your Eatwell Guide look like?
Make a copy of your Eatwell Guide in the space below. Add up the total portions from the 'foods high in sugar, salt and fat' graph and fill in the box on the right, using your own scale.

Total portions

Food high in sugar, salt, fat

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Lesson 2
What is a Healthy Diet?

Activity 3: How Healthy is my Diet?
Compare your Eatwell Guide to the official Eatwell Guide below.
- What are the **similarities**?
- What are the **differences**?
- What surprised you about your Eatwell Guide?
- How did the pandemic affected your diet?
- How do you think you could **improve** your diet?

Research is also about helping people change. People can find this very difficult but the EACH-B app will help and show YOU how easy it can be to build small changes into your life.

Eatwell Guide

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Activity 2: My Eatwell Guide   Time: 15 minutes

One source of data the scientists collected in both the TeC-19 study and Southampton Women's Survey were food diaries, as one way of collecting evidence about diet and health.

A) Fill in the Excel spreadsheet - it is suggested the spreadsheet is downloaded using excel

Students need their homework from the previous lesson, either a photo of their fridge, or a food diary for one day. (NB. This is not going to be an accurate assessment of their diet; if students have not completed the homework they can quickly note down what they can remember, if time this activity could also be extended over a week) Using their fridge photo/food diary the students input the data for a typical day into the Excel spreadsheet and produce a pie chart.

For teacher information: There is only one column which allows information to be inputted - the **green** column. The rows at the bottom show the totals calculated for the different food groups. The columns have been locked, so that the formulas can't be changed. There are columns in this spreadsheet which show the calculation, but for ease and to avoid confusion, these have been hidden. Once the data has been inputted, the second worksheet shows the resulting pie chart alongside an image of the Eatwell Guide. If there is no access for all students to a computer then this activity would still be worthwhile carrying out as a whole class teacher led activity using one example. Please refer back to the notes about analysing the Eatwell Guide from the PD day to ensure that consistent messages are being given to the students.

B) What does your Eatwell Guide look like?   Time: 5 minutes

Students record their own Eatwell Guide in their booklet and compare to the Government's recommended Eatwell Guide, **'What does your Eatwell Guide look like?'**

Activity 3: How Healthy is my Diet? 💬 Time: 5 minutes

Discuss with students *'What does your Eatwell Guide tell you about your own health?'*
'What were the similarities and differences between your guide and the recommended guide?' 'How did the pandemic affect your diet?' 'How could your diet be improved?'

Activity 4:
How can we collect health data? Time: 5 minutes

Revist the question at the start of this lesson, students now add any new ideas about the different methods which could be used to collect health data that they can come up with, e.g. Food diaries, questionnaires, body measurements, fitness/activity trackers, apps, monitors

Extension activity: What's in your fridge?

Scientists also used photos of people's fridges alongside food diaries and questionnaires when they were collecting data on people's diets for the Southampton Women's Survey.
Using the images of their own fridges, students can discuss the following questions, *'What does the photo reveal about your family's eating habits? Would it represent all the different foods you eat? If not, why not? How might it change during the week? How useful is this information?'*

Plenary

💬 ✏️ Time: 5 minutes

Students refer back to the lesson objectives and complete the assessment for learning activity in the orange boxes, feedback and share an interesting fact they have found out from the lesson.

Homework

Questions students could discuss at home: *'How healthy do you think your family diet is across a few days or a week? How did the pandemic affect your family's diet? How well does it compare to the Goverment's recommended EatWell Guide? How do you and your family aim to eat your 5 - a - day fruit and vegetables? What changes could you suggest to improve your family's overall diet?'*

Resources
- Lesson 2 PowerPoint slides
- Student booklet pages 11-16
- TeC-19 focus group transcript & audio recording
- Southampton Women's Survey newsletter
- **Student access to computers** with Eatwell Excel spreadsheet

Keywords
- evidence
- quantitative data
- qualitative data
- Eatwell Guide
- balanced diet

Lesson 3: What are Health Risks
Curriculum Links

L I F E L A B

Safety issues
Potential sensitivity relating to causes of death and non-communicable diseases

KS3 Science Programme of Study (DfE National Curriculum PoS)	KS4 GCSE Science Programme of Study (DfE National Curriculum PoS)
Scientific attitudes • understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review • evaluate risks **Experimental skills and investigations** • ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience **Analysis and evaluation** • present observations and data using appropriate methods, including tables and graphs • interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions • present reasoned explanations, including explaing data in relation to predictions and hypotheses • evaluate data, showing awareness of potential sources of random and systematic error • identify further questions arising from their results	**Development of Scientific thinking** • evaluating risks both in practical science and the wider social context, including perception of risk **Analysis and evaluation** • translating data from one form to another • interpreting observations and other data, including identifying patterns and trends, making references and drawing conclusions **Vocabulary, units, symbols and nomenclature** • developing their use of scientific vocabulary and nomenclature • recognising the importance of scientific quantities

KS4 GCSE Biology subject content (DfE National Curriculum PoS)
Health, disease and the development of medicines   • the relationship between health and disease   • non-communicable diseases   • the impact of lifestyle factors on the incidence of non-communicable diseases

KS3 Biology subject content (DfE National curriculum PoS)	KS4 GCSE Food preparation and nutrition (DfE National Curriculum PoS)
Nutrition and digestion • content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, dietary fibre and water, and why each is needed • calculations of energy requirements in a healthy daily diet • the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases	**Nutrition** • major diet related health risks including obesity, cardiovascular, bone health, dental health, iron deficiency anaemia, diabetes

PSHE
(DfE National Curriculum PoS)

Mental wellbeing
- that mental wellbeing is a normal part of daily life, in the same way as physical health
- where and how to seek support (including recognising the triggers for seeking support), including whom in school they should speak to if they are worried about their own or someones else's mental wellbeing or ability to control their emotions (including issues arising online)
- it is common for people to experience mental ill-health. For many people who do, the problems can be resolved if the right support is made available, especially if accessed early enough
- that happiness is linked to being connected to others
- common types of mental ill-health (e.g. anxiety and depression)
- the benefits and importance of physical exercise, time outdoors, community participation and voluntary and service-based activities on mental wellbeing and happiness

Physical health and fitness
- the characteristics and mental and physical benefits of an active lifestyle
- the risks associated with an inactive lifestyle (including obesity)
- the positive associations between physical activity and promotion of mental wellbeing, including as an approach to combat stress
- the characteristics and evidence of what constitutes a healthy lifestyle, maintaining a healthy weight, including the links between an inactive lifestyle and ill-health, including cancer and cardio-vascular ill-health

Healthy eating
- how to maintain healthy eating and the links between a poor diet and health risks, including tooth decay and cancer

Drugs alcohol and tobacco
- the facts about the harms from smoking tobacco (particularly the link to lung cancer), the benefits of quitting and how to access support to do so

Health and prevention
- the importance of sufficient good quality sleep for good health and how a lack of sleep can affect weight, mood and ability to learn

Behaviour Change Theory links

BCT 1.1   Goal setting (behaviour)
BCT 1.2   Problem solving
BCT 1.3   Goal setting (outcome)
BCT 1.8   Behavioural contract
BCT 1.9   Commitment
BCT 5.1   Information about health consequences
BCT 5.2   Salience of consequences
BCT 6.2   Social comparison
BCT 9.1   Credible source
BCT 9.2   Pros and cons
BCT 9.3   Comparative imagining of future outcomes

Lesson 3
What are Health Risks?

Objectives

At the end of this lesson students should be able to:

- Determine possible risks to our health
- Suggest how different factors might influence an individual's health
- Work collaboratively to carry out research on a non-communicable disease

Hook

'What do you think people are most likely to die from in the UK?'

Show NHS Atlas of Risk image, without labels to illustrate.

Activities:

‼️This lesson covers some sensitive issues and you may want to discuss these with students at the start, see 'Discussing sensitive issues' in the Teaching Tips on p.12. Introduce the lesson and share the objectives with the students. Individuals record how confident they are for each of the objectives at the start of the lesson.

Lesson 3
Causes of Death

When someone dies, a doctor or a coroner will decide the cause of death and record it on the person's death certificate.

The cause of death is based on rules set out by the International Classification of Diseases (ICD) and is obtained from the conditions reported by the doctor or coroner.

The cause is based on the **World Health Organisation** (WHO) definition as:

- the disease or injury that initiated the train of events directly leading to death, or
- the circumstances of the accident or violence that precedes the fatal injury.

The Department of Health has a list of hundreds of conditions which can be recorded on the death certificate as a cause of death.

Activity 1: Can you rank the causes of death?

Identify the **top 3 most** common and the **least** common in the UK

	most common	2nd most common	3rd most common	Least common
My suggestion				
Actual order				

Discuss what impact has COVID-19 had on the causes of death?

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Lesson 3
Causes of Death

Activity 2: Can you sort the cards into three groups?

1. Identify group A and B and write your own classification for group C in the boxes below:

A.
_____ Diseases are diseases which are unable to be passed from one person to another, so you can't contract them from somebody.

List 3 that are linked to lifestyle behaviours:
-
-
-

B.
_____ Diseases are diseases which can be passed from one person to another, so you can contract them from somebody.

C. Other

2. How do non-communicable diseases affect the risk for COVID-19 patients?

3. Which category do each of the top 3 most common causes of death fit into?

Activity 3: How has this changed over time?

How do you think the main causes of death have changed over time?
What do you think has led to these changes?

Identify 3 advances that have improved public health over time.

Public health advance	How has it affected public health?

19

Starter

Activity 1: Ranking causes of death   Time: 5 minutes

Students working in small groups are given the "causes of death" cards which represent the main causes in the UK. Ask the students to rank the cards in order, *'What do you think are the three most common causes of death in the UK? What is the least common cause of death?'* Compare their choice of cards to the correct "causes of death" graphic, *'How did you compare to the actual causes of death in the UK? Are you surprised? How might COVID-19 affect each of the causes of death?'* Discuss how the pandemic indirectly increased deaths e.g. stopping cancer treatments, appointments. (Note 'age' is missing from the risks as this is not medically classified as a cause of death). Students record the correct ones in their table. NB this is over the entire lifecourse, if we change the age parameters the cause of death changes. E.g. in children the main cause of death is accidents.

Activity 2: Sorting "causes of death"   Time: 10 minutes

'How could you sort the cards?' Students decide how to classify their cards into categories. Students share their ideas, justifying how they have classified their cards. *'What are your reasons for putting them into those groups?'*

Highlight the differences between communicable diseases (CDs - those we can 'contract' from other people) and non-communicable diseases (NCDs - those which we cannot 'contract' from other people), record the classifications in their booklets, then re-sort the cards into the three groups.

'How do non communicable diseases affect the risk of complications for COVID-19 patients?' Key point is NCDs are still the most common cause of death in this country, increasing the risk for COVID-19 patients, and are directly linked to lifestyle choices.

'Which category do the 3 most common causes of death fit into?' Also note that many of the causes of death could be put into more than one category eg. Respiratory Disorders: Bronchitis and COPD could be placed as a NCD, but flu could be placed as a CD and Asthma as other. As long as the students can justify why they have classified them in the groups then it is acceptable.

Activity 3: How has this changed over time?   Time: 5 minutes

Ask the students *'How do you think the main causes of death have changed over time? Would they be in the same order if we went back in history? Explain why and what has changed. How might COVID-19 affect the causes of death?'* Students identify 3 Public Health advances and suggest how these advances have contributed to improvements to public health, e.g. Social factors include the NHS, better housing, sanitation, clean water provision, nutrition and food safety, education. Medical advances include discoveries of antibiotics and vaccinations, improvements in childbirth and surgery.

Lesson 3
Non-Communicable Diseases (NCDs)

LIFELAB

Type 2 Diabetes
There are 4.2 million people diagnosed with diabetes in the UK, but a further 1 million people are believed to have the condition but have not been diagnosed.

DIABETES UK

Heart disease
Coronary heart disease is the UK's biggest killer, causing 73,000 deaths each year, an average of 190 people each day, or one every seven minutes.

Mental Health and Wellbeing
1 in 10 young people will experience a mental health problem. The number of young people attending A&E with a recorded mental condition has almost tripled since 2010.

YOUNGMINDS

Chronic Obstructive Pulmonary Disease (COPD)
The total annual cost to the NHS is estimated to be over £800 million for direct health care costs and 24 million working days per year are lost due to COPD.

Cancer
4 in10 cancers could be prevented. Overweight and obesity is the second biggest preventable cause of cancer after smoking.

CANCER RESEARCH UK

Stroke
Every year it is estimated that more than 152,000 people in the UK have a stroke. That's one person every three and a half minutes.

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Lesson 3
Researching Non-Communicable Diseases

LIFELAB

Activity 4: My group's NCD is:

What is it?	**Who gets it?**
Explain what area of the body is involved, and what is happening to that area.	Who is at more risk and why ? e.g. Males/Females, Age?
	Should people affected take extra precautions to shield from COVID-19?

What are the symptoms?	**What are the risk factors?**
What do people affected suffer from?	For example: Is the condition more likely if you smoke, or are overweight?
	How would COVID-19 affect this condition?

What is the treatment?	**What can we all do to reduce our risk?**
Medicines, operations or lifestyle changes.	
	What lifestyle choices might you want to make?

Useful website links can be found at the back of this booklet.

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Lesson 3
What are Health Risks?

L I F E L A B

Main

Activity 4: Researching Non-Communicable Diseases
Time: 30 minutes

Split the class up into six groups to research the following NCDs, using the websites identified in the student book on p.20 (web addresses can be found in the back of the student booklet) or text books:

A. Type 2 Diabetes
B. Heart disease
C. Mental Health and Wellbeing (recently classified by the World Health Organisation as an NCD)
D. COPD (Chronic Obstructive Pulmonary Disease)
E. Cancer (NB there are many different cancers. Ideally students should try and give a general overview on lifestyle related cancers, e.g. lung, mouth, oesophogeal, bladder, breast, colon, skin etc, but if needed focus on the most common type, which is lung cancer, accounting for 25.5% of all cancers)
F. Stroke

Students record their findings in their student booklet.

Plenary

Time: 10 minutes

Feedback about different NCDs between groups, sharing their findings:

What is it? *Explain what area of the body is involved, and what is happening to that area.*

Who gets it? *Who is at more risk and why? e.g. Males/Females, Age? Should people affected take extra precautions to shield from COVID-19?*

What are the symptoms? *What do people affected suffer from?*

What are the risk factors? *For example: Is the disease more likely if you smoke, or are overweight? How would COVID-19 affect this disease?*

What is the treatment? *Medicines, operations or lifestyle changes.*

What can we all do to reduce our risk? What lifestyle choices might you want to make?

Students refer back to the lesson objectives and complete the assessment for learning activity in the orange boxes, feedback and share an interesting fact they have found out from the lesson.

Resources

- Lesson 3 PowerPoint slides
- Student booklet pages 17-21
- Causes of death cards x6 sets
- **Student access to internet** to research NCDs
- NCD resources – text books, printed materials from website, leaflets (if no internet access available)

Keywords

- non-communicable diseases
- type 2 diabetes
- heart disease
- COPD
- cancer
- stroke
- cardiovascular disease

Curriculum Links

LIFELAB

Safety issues
Potential sensitivity relating to death of a relative

KS3 Science Programme of Study (DfE National Curriculum PoS)	KS4 GCSE Science Programme of Study (DfE National Curriculum PoS)
Scientific attitudes • pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility • understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review • evaluate risks **Experimental skills and investigations** • ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience **Analysis and evaluation** • interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions • identify further questions arising from results	**Development of Scientific thinking** • evaluating risks both in practical science and the wider social context, including perception of risk **Experimental skills and strategies** • use scientific theories and explanations to develop hypotheses **Analysis and evaluation** • translating data from one form to another • interpret observations and data including identifying patterns and trends, make inferences and draw conclusions • being objective, evaluating data in terms of accuracy. precision, repeatability and reproducability and identifying potential sources of random and systematic error
KS3 Biology subject content (DfE National Curriculum PoS)	KS3 Biology subject content (DfE National Curriculum PoS)
Nutrition and digestion • content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, dietary fibre and water, and why each is needed • the impact of exercise, asthma and smoking on the human gas exchange **Genetics and evolution; inheritance, chromosomes, DNA and genes** • heredity as the process by which genetic information is transmitted from one generation to the next	**Health, disease and the development of medicines** • the relationship between health and disease • the impact of lifestyle on the incidence of non-communicable diseases **KS4 GCSE Food preparation and nutrition (DfE National Curriculum PoS)** **Nutrition** • major diet related health risks including obesity, cardiovascular, bone health, dental health, iron deficiency anaemia, diabetes
KS3 Physical Education (DfE National Curriculum PoS)	KS4 Physical Education (DfE National Curriculum PoS)
• they should develop the confidence and interest to get involved in exercise, sports and activities out of school and in later life, and understand and apply the long term health benefits of physical activity	• they should get involved in a range of activities that develops personal fitness and promotes an active, healthy lifestyle

PSHE (DfE National Curriculum PoS)

Physical health and fitness
- the risks associated with an inactive lifestyle (including obesity)
- the positive associations between physical activity and promotion of mental wellbeing, including as an approach to combat stress
- the characteristics and evidence of what constitutes a healthy lifestyle, maintaining a healthy weight, including the links between an inactive lifestyle and ill-health, including cancer and cardio-vascular ill-health

Healthy eating
- the characteristics of a poor diet and risks associated with unhealthy eating (including, for example, obesity and tooth decay) and other behaviours (e.g. the impact of alcohol on diet or health)

Drugs, alcohol and tobacco
- the physical and psychological risks associated with alcohol consumption and what constitutes low risk alcohol consumption in adulthood
- the physical and psychological consequences of addiction, including alcohol dependency
- the facts about the harms from smoking tobacco (particularly the link to lung cancer), the benefits of quitting and how to access support to do so

Behaviour Change Theory links

BCT 1.1   Goal setting (behaviour)
BCT 1.8   Behavioural contract
BCT 1.9   Commitment
BCT 5.5   Anticipated regret
BCT 9.3   Comparative imagining of future outcomes

Lesson 4
Assessing Health

Objectives

At the end of this lesson students should be able to:
- Identify risk factors that can affect our health
- Analyse evidence from different sources
- Draw conclusions from the evidence

Hook

Spot the health risks
Show the pictures of the livers and lungs.
'What are the differences?'
'What do you think may have caused these differences?' 'How do you think the individuals' health was affected?'

Activities:

‼️ This lesson may be sensitive for some students, i.e. loosing a grandparent and you may want to discuss these with students at the start, see 'Discussing sensitive issues' in the Teaching Tips on p.12. Introduce the lesson and share the objectives with the students. Individuals record how confident they are for each of the objectives at the start of the lesson.

Physical Inactivity
A lack of exercise causes;
Heart attack
Stroke
Bowel cancer
Breast cancer
Diabetes

High Cholesterol
High cholesterol causes;
Heart attack
Stroke

Obesity
Obesity causes;
Heart attack
Stroke
Complications due to Type 2 diabetes
High blood pressure
Some cancers

Alcohol
Drinking too much alcohol causes;
Stomach cancer
Oesophageal cancer
Liver disease
Stroke
Liver cancer
Breast cancer

Low Fruit and Vegetables
A diet low in fruit and vegetables causes;
Heart attack
Stroke
Some cancers

Non-Transport Accidents
For example;
Falls
Accidental drug overdose (e.g. heroin)
Choking and suffocation
Fire
Drowning

Smoking
Smoking causes;
Lung cancer
COPD (obstructed airways)
Heart attack
Pneumonia
Stroke
Other types of cancer

Infections
For example;
Diarrhoea and vomiting
Bacterial diseases
HIV
Tuberculosis
Influenza/Flu
COVID-19

High Blood Pressure
High blood pressure causes;
Heart attack
Stroke
Heart failure

Activity 1: Play the Tower of Risk
Tower of Risk instructions
Take it in turns to remove a block and after each turn **discuss** the following points in your group:
- Identify your risk
- How high/big is your risk compared to others?
- What could it lead to?
- How could you reduce this risk?
- What would be the risk for someone with COVID-19?

Risks leading to death in perspective

Tower of RISK

Starter

Activity 1: Tower of Risk   **Time: 15 minutes**

Discuss and clarify a definition for risk, *'What do we mean by risk?'*
Students play 'Tower of Risk' using the play instructions; in small groups they take it in turns to remove a block. At each turn they identify the 'risk' they have removed to the rest of the group and discuss *'How big a risk is it? What could it lead to? How could you reduce the risk? What changes could you make to your lifestyle? How would COVID-19 affect you?'* Key point is that a healthy lifestyle will make all bodily functions work better, including immunity, helping you to live longer. Eating a healthy diet, keeping physically active, not smoking, limiting alcohol intake, and getting enough relaxation and sleep are key components of a healthy lifestyle.
The player who makes the tower fall is dead and needs to inform the rest of the group which block/risk led to their cause of death.
Note the number of blocks for each risk have been calculated so that they are in proportion to NHS statistical data on risks linked with causes of death in the UK.
After playing the game the whole class discuss - *'Which risk made tower fall most often? Is this what you expected? Explain why'* Highlight the accumulation of risk factors during a "life''.

Lesson 4
How can health data help individuals?

This bar chart shows some of the data collected during the COVID-19 pandemic

What does the data tell us?

How could you use this data?

Who might this data be useful to?

Proportion of deaths involving coronavirus by main pre-existing condition, England and Wales, occurring in March 2020

Males 0-69 | Males 70+ | Females 0-69 | Females 70+

Heart diseases
Dementia and Alzheimers disease
Respiratory diseases
Influenza and pneumonia
No pre-existing conditions
Diabetes

0% 5% 10% 15% 20%

Source: Office for National Statistics

Activity 2: What health conditions increase the risk for people suffering with COVID-19?

Identify three groups of people who are at increased risk:

-
-
-

Discuss what extra precautions may these people need to consider taking to reduce their risk?

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Lesson 4
Assessing Chris's Health

A: Family background and history
Sources - family tree, Grandad's death certificate, family medical history and set of family cards, with information on Chris's relatives and friends.

B: Current lifestyle
Sources - Chris's food diary, sleep report, activity log, Chris's Eatwell Guide, Mum's weekly shopping list and a fridge photo. Transcript of Chris's TeC-19 focus group.

C: Early development and childhood
Sources - Midwifery notes including mother's lifestyle, and notes from baby book which includes growth chart birth weight, breast/bottle-feeding.

Activity 3: Researching Chris's health
- Which pieces of evidence are most helpful?
- Why are they helpful, what does the evidence tell you?
- What are the health risks Chris may face in the future?
- Who in Chris's family is most at risk from COVID-19 based on their health data?
Use the table on the **following page** to summarise your findings.

Activity 4: Sharing findings
Share your findings with the other groups, and record their findings

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Main

Activity 2: What health conditions increase the risk for people suffering with COVID-19?
Time: 5 minutes

Using the data sources on the PowerPoint, discuss with students *'What does the data tell us? How could you use this data? Who might find this data to be useful? What extra precautions may these people need to consider taking to reduce their risk?'* Students identify three groups in their booklet.

Identifying groups at heightened risk of severe illness: Individuals aged 70 and over; individuals with one or more underlying health conditions including lung conditions such as asthma and bronchitis, diabetes, heart disease, liver disease, kidney disease; individuals who are obese; individuals receiving medication or treatment that can affect the immune system including chemotherapy and immunotherapy; men are at a higher risk than women; individuals from Black, Asian and Minority Ethnic backgrounds are at higher risk than those from other ethnic groups.

Note that many of these conditions are linked to lifestyle and therefore we have some control and can reduce our individual risk by making the right health choices. *'What positive lifestyle choices could you make to reduce your risk?'* *'What positive affects will these have on your health?'*

Activity 3: Researching Chris's health
Time: 30 minutes

Introduce Chris and his family to the students and have a look at his family tree and his Grandad's death certificate. *'What does the death certificate tell us? Could his Grandad have done anything to prevent his death at such a relatively young age?'*

The main purpose of this activity is for students to consider all the information provided about Chris and based on their knowledge, understanding and views about what being healthy means, answer the following:

- *How healthy is Chris?*
- *What are the health risks that Chris may have to face?*

Ask the students *'What would a scientist do if they had to answer these questions? How are we going to approach this problem like scientists do? What data would the scientists collect to be able to make informed evidence-based conclusions?'*

Assessing Health

L I F E L A B

Activity 3: Researching Chris's health *continued*

There are three main sets of evidence which need to be considered, these are Chris's family background, current lifestyle and early development. Students should work in groups of 4/5 to explore one of these three factors using the sources of evidence supplied in the teacher's resource pack:

Group A - look into Chris's family background and medical history, using a family tree, Grandad's death certificate and set of family cards, with information about Chris's relatives and friends.

Group B - look into Chris's current lifestyle, using Chris's food diary, sleep report, activity log, Eatwell Guide, Mum's weekly shopping list and fridge photo, transcript of Chris's TeC-19 focus group.

Group C - look into Chris's early development and childhood, using midwifery notes including mother's lifestyle and notes from baby book which include: growth chart, birth weight, and breast/bottle feeding.
N.B. This activity would suit an extension group.

Each group needs to summarise:
- *Which pieces of evidence are most helpful?*
- *Why are they helpful, what does the evidence tell you?*
- *What are the health risks Chris may face in the future?*
- *Who in Chris's family is most at risk from COVID-19 based on their health data?*

Activity 4: Experts sharing findings/collaborative learning   **Time: 10 minutes**

Each group cascades their information to the other two groups, ensuring that all groups have had a chance to listen to information and ideas from all three sources of evidence.
Finally the groups complete the summary sheet to record their findings.
(e.g. Grp A splits up and joins with grps B & C, to talk to them about what they have found out about Chris. After a 5-minute discussion grp A return and grp B and then finally grp C splits, repeating the process each time).

Plenary

Time: 5 minutes

Preparation for the LifeLab activity day. Ask students to consider what additional information they need to know about Chris, discuss *'What other information would you like to know about Chris? What things could you measure or test that would help decide how healthy Chris is?'*
Students record the additional information they want to collect from Chris on the summary sheet, to refer to on their visit.
Students refer back to the lesson objectives and complete the assessment for learning activity in the orange boxes, feedback and share an interesting fact they have found out from the lesson.

Resources
- Lesson 4 PowerPoint slides
- Student booklet pages 22-28
- Tower of risk game x4 sets
- Family history cards and Family data sheet
- Food diary, sleep report, Eatwell Guide, fridge photo, shopping list
- Midwifery notes and baby book

Keywords

- evidence
- midwife
- lifestyle
- risk factor

LifeLab Activities
Curriculum Links

L I F E L A B

KS3 Science Programme of Study (DfE National Curriculum PoS)	KS4 GCSE Science Programme of Study (DfE National Curriculum PoS)
Scientific attitudes • pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility • understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review • evaluate risks **Experimental skills and investigations** • ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience • select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent and control variables, where appropriate • use appropriate techniques, apparatus and materials during fieldwork and laboratory work, paying attention to health and safety • make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements **Analysis and evaluation** • apply mathematical concepts and calculate results • present observations and data using appropriate methods, including tables and graphs **Measurement** • understand and use SI units • use and derive simple equations and carry out appropriate calculations • undertake basic data analysis including simple statistical techniques	**Development of Scientific thinking** • the ways in which scientific methods and theories develop over time • using a variety of concepts and models to develop scientific explanations and understanding • appreciating the power and limitations of science and considering ethical issues which may arise • explaining every day and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments • evaluating risks both in practical science and the wider societal context, including perception of risk • recognising the inportance of peer review of results and of communication of results to a range of audiences **Experimental skills and strategies** • carry out experiments appropriately, having due regard to the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations • make and record observations and measurements using a range of apparatus and methods **Analysis and evaluation** • present observations and data using appropriate methods • translating data from one form to another • carry out and represent mathematical and statistical analysis • interpret observations and other data, including identifying patterns and trends, make inferences and drawing conclusions • being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error **Vocabulary, units, symbols and nomenclature** • developing their use of scientific vocabulary and nomenclature • use SI units • use prefixes and powers of ten for orders of magnitude (e.g. kilo, centi, milli, micro, nano) • using an appropriate number of significant figures in calculations

KS3 Biology subject content (DfE National Curriculum PoS)	KS4 Biology subject content (DfE National Curriculum PoS)
Structure and function of living organisms; cells and organisation • cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope • the function of the cell membrane, cytoplasm and nucleus **Nutrition and digestion** • content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, dietary fibre and water, and why each is needed • the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases **Gas exchange systems** • the structure and function of the gas exchange system in humans, including adaptation to function • the mechanism of breathing to move air in and out of the lungs, including simple measurements of lung volume • the impact of exercise, asthma and smoking on the human gas exchange system **Genetics and evolution; inheritance, chromosomes, DNA and genes** • heredity as the process by which genetic information is transmitted from one generation to the next • a simple model of chromosomes, genes and DNA in heredity	**Cell Biology** • cells as the basic structural unit of all organisms; adaptations of cells related to their functions; the main sub-cellular structures of eukaryotic and prokaryotic cells **Transport systems** the relationship between the structure and functions of the human circulatory system **Health, disease and the development of medicines** • the relationship between health and disease • non-communicable diseases • the impact of lifestyle on the incidence of non-communicable diseases **Evolution, inheritance and variation** • the genome as the entire genetic material of an organism • how the genome, and it's interaction with the environment, influence the development of the phenotype of an organism • most phenotypic features being the result of multiple, rather than single, genes • the uses of modern biotechnology including gene technology; some of the practical and ethical considerations of modern biotechnology

KS4 GCSE Food preparation and nutrition (DfE National Curriculum PoS)
Nutrition • major diet-related health risks including obesity, cardiovascular, bone health, dental health, iron deficiency anaemia, diabetes

KS3 Physical Education (DfE National Curriculum PoS)	KS4 Physical Education (DfE National Curriculum PoS)
• they should develop the confidence and interest to get involved in exercise, sports and activities out of school and in later life, and understand and apply the long term health benefits of physical activity	• they should get involved in a range of activities that develops personal fitness and promotes an active, healthy lifestyle

PSHE
(DfE National curriculum PoS)

Mental wellbeing
- that mental wellbeing is a normal part of daily life, in the same way as physical health
- that there is a normal range of emotions (e.g. happiness, sadness, anger, fear, surprise, nervousness) and scale of emotions that all humans experience in relation to different experiences and situations
- simple self-care techniques, including the importance of rest, time spent with friends and family and the benefits of hobbies and interests
- where and how to seek support (including recognising the triggers for seeking support), including whom in school they should speak to if they are worried about their own or someones else's mental wellbeing or ability to control their emotions (including issues arising online)
- it is common for people to experience mental ill-health. For many people who do, the problems can be resolved if the right support is made available, especially if accessed early enough
- that happiness is linked to being connected to others
- the benefits and importance of physical exercise, time outdoors, community participation and voluntary and service-based activities on mental wellbeing and happiness

Physical health and fitness
- the characteristics and mental and physical benefits of an active lifestyle
- the risks associated with an inactive lifestyle (including obesity)
- the positive associations between physical activity and promotion of mental wellbeing, including as an approach to combat stress
- the characteristics and evidence of what constitutes a healthy lifestyle, maintaining a healthy weight, including the links between an inactive lifestyle and ill-health, including cancer and cardio-vascular ill-health

Healthy eating
- the characteristics of a poor diet and risks associated with unhealthy eating (including, for example, obesity and tooth decay) and other behaviours (e.g. the impact of alcohol on diet or health)

Health and prevention
- the importance of sufficient good quality sleep for good health and how a lack of sleep can affect weight, mood and ability to learn

Basic first aid
- life-saving skills, including how to administer CPR

Behaviour Change Theory links

BCT 1.1   Goal setting (behaviour)
BCT 1.3   Goal setting (outcome)
BCT 1.4   Action planning
BCT 1.8   Behavioural contract
BCT 1.9   Commitment
BCT 2.3   Self-monitoring of behaviour
BCT 2.6   Biofeedback
BCT 5.1   Information about health consequences
BCT 5.2   Salience of consequences
BCT 6.1   Demonstration of the behaviour
BCT 6.2   Social comparison
BCT 8.1   Behavioural practice/rehearsal

TEACHER INFORMATION

Thank you for booking a LifeLab Day, we look forward to welcoming you and your students soon. Please read the following information before you attend, and sign the agreement overleaf.

- Students must wear school uniform

- All students will need to bring a packed lunch

- Your coach driver will be given details of the hospital drop off point and a member of LifeLab staff will meet you there. Students will need to move through the hospital in groups of no more than 15. We do have to walk through clinical areas so would appreciate it if you could ensure that students know that noise should be kept to a minimum.

- If you are the last class from your school visiting LifeLab, please return all appropriate resources to us during your visit

TEACHER AGREEMENT

For completion by teacher attending LifeLab Day

Please initial the box

I have read and agree with the following statements:

- I will ensure that, to the best of my knowledge, no students are unwell on the day of the visit (students who have been suffering with vomiting or diarrhoea must be clear of symptoms for 48 hours before they visit the hospital)

- I will inform LifeLab staff of any health problems or other relevant issues relating to specific pupils on arrival

- I will ensure that all students remain on the LifeLab premises at all times (Students are not permitted to leave LifeLab to buy food or use the shops etc.)

- Two members of staff will be present during the visit

- I will take responsibility for student behaviour and discipline

- I will ensure that all students have parental consent to attend the LifeLab Day and participate in activities, and will return all consent forms to LifeLab staff on the day of the visit or before.

Name of School……………………………

Name of Teacher…………………………………

Signature: ……………………………………………….. Date: ………………

LifeLab Activities

Objectives

At the end of the LifeLab activities students should be able to:
- Describe how scientists measure health
- Use scientific equipment safely to collect health measurments
- Explain how genes could affect your health
- Describe some of the research being carried out at the University and the Hospital
- Design a health pledge to improve their own long-term health

LifeLab App

Research shows that young people are good at identifying what is good for their health. However, the problem facing young people is how to put their knowledge of healthy lifestyle choices into action.

We have worked with game designers to develop an interactive app for young people to use on smartphones to support them making healthy choices.

Avatar
What is your avatar going to look like?

Activity Quest
How could you challenge yourself and your friends to get more active?

Food Challenges
How can you make a fun, healthy breakfast?

Gutsy
What do you need to feed Gutsy to make Gutsy feel good?

Tick the box when you have successfully downloaded the LifeLab app ☐

LifeLab Flight Case

To enable schools to access the LifeLab day activities in school during COVID-19 restrictions, we have packaged up the activities into a flight case to send them out to your school! There will be a detailed teachers' guide accompanying the flight case to support the delivery of the activities, along with student information sheets and PowerPoints for all the activities.

Downloading the LifeLab app

Students will be given instructions on how to download the LifeLab app. Please remind your students about using the app in the post LifeLab Activity lessons.

The app is designed to support students in making healthy behaviour changes through eating well and being more physically active.

Parents will also have access to a parent app with information and help on how they can support their child at home.

Health Pledge

Please find a copy of the A3 student health pledge over the page, an electronic copy is stored on the teachers' memory stick.

To support students with their health pledge, practise engaging with them in Healthy Conversation Skills using *"What?"* and *"How?"* questions.

Please find Healthy Conversation Skills training and support for teachers online at: www.southampton.ac.uk/lifelab/professional-development.page (password: LifeLab01)

Meet the Scientist Interviews

We have recorded several interviews with scientists and researchers who work at Southampton University and University Hospital Southampton. These interviews are availble to view via the link: www.efolio.soton.ac.uk/blog/lifelab/meet-the-scientist/

Level Up Your Life

Discuss with a partner the following questions.........

1. What area of your lifestyle could you change to impove your health?
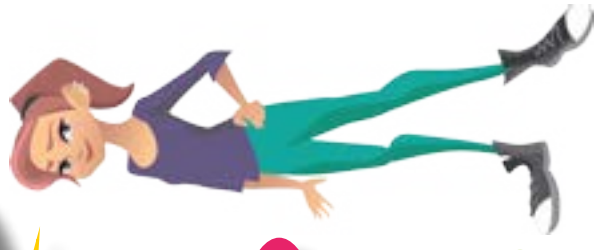
2. How important is this for you?

3. What are the possible changes you could make to improve this area of your life?

4. What would be the best change to fit in with your lifestyle?

5. What difference will this change make to your life?

6. How confident are you that you can do this on a scale of 1-5 ?

After your discussion fill in the boxes below:
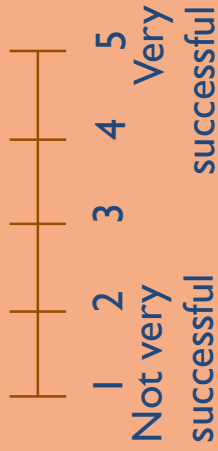
1. My health pledge is to.........

Level up Your Life

2. What is the first step you will **take** to start this pledge?

3. How will you make it **measurable?**
e.g. When will you start? How often? Which days? How many? How long?

4. What might make it **difficult** for you to achieve your pledge?

5. How could you get over these difficulties? Who might **support** you with this pledge?

6. How **long** will it take you to achieve this pledge? What will be the **positive impact** on your health?

Back at school - 7. How **successful** was your pledge?

1   2   3   4   5
Not very successful   Very successful

What will be you next steps?

WHAT NEXT?

Chris's Measurements Summary

You will need to use data on Chris's health data to complete the 'How are You' Quiz for him. Most of this will have been collected during the LifeLab day but any information you need for the quiz can be found below.

Measurement	Value
Blood pressure	110 systolic, 70 diastolic
Grip strength	25.9 kg
Flexibility	9 cm
Jump height	44 cm
Blood glucose	Normal
Height	158 cm
Mass	45 kg
BMI	18
Waist circumference	80 cm
Percentage body fat	21%
Peak flow	390 l/min
FVC	2.8 l

'How are You' Quiz Questions and Answers:
How are you feeling right now?
Mostly full of beans
Can run a little way
Feel fairly calm
Sleep fairly well
Feel quite lean
Feel fairly happy
What stops you taking care of yourself?
I don't know what to do
Who depends on you being healthy?
None of these
Apart from not getting ill, what are your top 3 health priorities?
Having more energy, feeling young, having a more active social life
Eating choices:
A - sugary drinks, A - chips, C - plain cereal, A- hard cheese, A - burger
How many servings of fruit and vegetables do you eat a day?
1-2
What snacks do you eat in a normal day?
Crisps and cakes
Drinking:
Never

Chris's Measurements Summary

'How are You' Quiz Questions and Answers:
How much exercise do you get every day?
Monday - 20 minutes
Tuesday - 1 hour
Wednesday - 30 minutes
Thursday - 30 minutes
Friday - 1 hour
Saturday - 1 hour
Sunday - none
How much strengthening activity do you do?
Monday - none
Tuesday - 30 minutes
Wednesday - none
Thursday - none
Friday - none
Saturday - none
Sunday - none
Do you smoke?
No

Safety issues
Potential sensitivity relating to health risks

KS3 Science Programme of Study (DfE National Curriculum PoS)	KS4 GCSE Science Programme of Study (DfE National Curriculum PoS)
Scientific attitudes • pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility • evaluate risks **Experimental skills and investigations** • ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience • select plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables where appropriate • make and record observations and measurements using a range of methods for different investigations; and evaluate reliability of methods and suggest possible improvements **Analysis and evaluation** • present observations and data using appropriate methods, including tables • interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions • present reasoned explanations, including explaining data in relation to predictions and hypotheses • evaluate data, showing awareness of potential sources of random and systematic error • identify further questions arising from their results	**Development of Scientific thinking** • appreciating the power and limitations of science and considering ethical issues which may arise • explaining everyday and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments • evaluating risks both in practical science and the wider social context, including perception of risk • recognising the importance of peer review of results and of communication of results to a range of audiences **Experimental skills and strategies** • use scientific theories and explanations to develop hypotheses • making and recording observations and measurements using a range of apparatus and methods **Analysis and evaluation** • presenting observations and other data using appropriate methods • translating data from one form to another • interpret observations and data including identifying patterns and trends, make inferences and draw conclusions • presenting reasoned explanations, including relating data to hypotheses • being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error
KS3 Biology subject content (DfE National Curriculum PoS)	**KS4 Biology subject content (DfE National Curriculum PoS)**
Nutrition and digestion • the consequences of imbalance in the diet, including obesity, starvation and deficiency diseases	**Health, disease and the development of medicines** • the relationship between health and disease • non-communicable diseases • the impact of lifestyle on the incidence of non-communicable diseases

KS4 GCSE Food preparation and nutrition (DfE National Curriculum PoS)
Food choice • how to make informed choices about food and drink to achieve a varied and balanced diet, including awareness of portion sizes and costs

PSHE
(DfE National Curriculum PoS)

Physical health and fitness
- the risks associated with an inactive lifestyle (including obesity)
- the characteristics and evidence of what constitutes a healthy lifestyle, maintaining a healthy weight, including the links between an inactive lifestyle and ill-health, including cancer and cardio-vascular ill-health

Internet safety and harms
- how to be a discerning consumer of information online including understanding that information, including that from search engines, is ranked, selected and targeted
- the similarities and differences between the online world and the physical world, including: the impact of unhealthy or obsessive comparison with others online (including through setting unrealistic expectations for body image), how people may curate a specific image online, over-reliance on online relationships including social media, the risks related to online gambling including the accumulation of debt, how advertising and information is targeted at them and how to be a discerning consumer of information online

Behaviour Change Theory links

BCT 1.2   Problem solving
BCT 5.1   Information about health consequences
BCT 9.2   Pros and cons
BCT 9.3   Comparative imagining of future outcomes
BCT 16.3 Vicarious consequences

Lesson 5
Making Choices

Objectives

At the end of this lesson students should be able to:
- Analyse health data and health risks
- Review progress made with health pledge
- Evaluate marketing strategies used in selling food

Hook

The Power of Marketing Alphabet Challenge on lesson PowerPoint

Activities:

‼️This lesson covers some sensitive issues and you may want to discuss these with students at the start, see 'Discussing sensitive issues' in the Teaching Tips on p.12. Introduce the lesson and share the objectives with the students. Individuals record how confident they are for each of the objectives at the start of the lesson.

Lesson 5
Risk Checker

Complete the 'How are You' Quiz

Activity 1:
Thinking about your own health

Complete the quiz about your own attitudes towards health and wellbeing.

How would you rate your own health and wellbeing?

Very Bad 1 — 2 — 3 — 4 — 5 Very Good

How does your **health pledge** help you improve your health and wellbeing?

Starter:

Activity 1: Thinking about your own health

Time: 10 minutes

Students can either enter Chris's or their own data into the online 'How are You' Quiz, NHS tool: www.nhs.uk/oneyou/how-are-you-quiz/

Chris's information is included on p.55 of the teacher's guide and on the memory stick. The quiz is designed for over 18's however the questions are appropriate for teenagers. We recommend you do the quiz yourself first to judge the suitability for your class. **N.B. students do not need to enter their contact details.**
Class discussion, *'How would you rate Chris's or your own health? How important is your health to you?'*
Suggest ways in which either themselves or Chris could change their/his behaviour to reduce the risk of developing an NCD, *'How could you/Chris reduce your/his risk? How does your health pledge help you improve your health?'*

Main

Activity 2: Are you aware of the marketing tactics used?

Time: 5 minutes

Students discuss all the possible methods that they can think of that companies use to encourage young people to buy their food products.

Activity 3: What marketing tactics are you aware of?

Time: 15 minutes

Working in small groups students look at the images on the cards showing examples of different marketing methods used and ask the following questions *'What are the different methods used? Which ones have you experienced yourself? Where are they used? How do you think they work?* Share a summary of their key ideas with the whole class, question and answer through discussion.

NB The Goverment's Childhood Obesity Strategy gives teachers further background to support this lesson and can be found here: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718903/childhood-obesity-a-plan-for-action-chapter-2.pdf

Lesson 5
Making Choices

LIFELAB

Lesson 5
Who Controls What you Eat?

The facts:

- There is a conclusive link between the diet of children and teenagers and their mental and emotional health and wellbeing
- Our environment has slowly changed, making it harder for children and teenagers to make healthy choices
- Efforts to help children eat healthily are being undermined by sophisticated promotions for unhealthy foods
- Unhealthy foods are three times cheaper than healthy food
- Half of breakfast cereals marketed to children and teenagers are high in sugar and a single portion would make up a third of their daily allowance

Activity 2: How do you think companies encourage you to buy junk food?
Discuss all the possible methods that you can think of with a partner.

Activity 3: What marketing tactics are you aware of?
Have a look at examples of the different marketing tactics used on the cards.
How many have you experienced?
Rank the cards in order of which you are most concerned about to the least concerned.

Did you know?

- Children and teenagers are particularly susceptible to advertising of unhealthy food and drink. See it, want it, buy it, eat it!
- Marketing techniques used to target children and teenagers are increasingly sophisticated, and often work at a subliminal level that is not recognised

Lesson 5
Food Marketing Strategies

Activity 4: Who is feeding teenagers' junk food habits?
Describe 3 different examples of marketing tactics you have experienced in the table below:

Location of where you are being targeted?	What tactics do they use? How do they work?	How does this make you feel? What do you think should be done about this?

If you had the power, what changes would be your priority?

Find out how aware the rest of your family are of these marketing strategies.

Main

Activity 4: Who is feeding teenagers' junk habits?   Time: 20 minutes
Students choose three examples of the marketing strategies that they have experienced to complete the table, describing in more detail what the marketing strategies are and what are the students' opinions about them.
N.B. The following website enables you to look at the different food outlets surrounding your school using the mapping the food environment across the UK tool at www.feat-tool.org.uk/feat2/

Plenary

Time: 5 minutes
Students refer back to the lesson objectives and complete the assessment for learning activity in the orange boxes, feedback and share an interesting fact they have found out from the lesson.

Remind students about using the LifeLab app they downloaded

Homework/Extension Activity

Encourage the students to reflect on the few '*healthy*' adverts that are available and whether they remember or feel as enticed by them as the unhealthy adverts and why they might feel differently about them. Healthy examples could include Colin the Carrot in Aldi's Christmas adverts and perhaps even the age old Popeye who most students today probably don't even know about! More healthy examples are on the teacher's PowerPoint.

Resources
- Lesson 5 PowerPoint slides
- Student booklet pages 44-47
- **Access** to internet for online 'How are You' Quiz
- Students' own health pledges
- Marketing tactic cards x6 sets

Keywords
- risk factors
- pledge
- marketing strategy

Curriculum Links

Safety issues	
Potential sensitivity relating to health risks	
KS3 Science Programme of Study (DfE National Curriculum PoS)	**KS4 GCSE Science Programme of Study (DfE National Curriculum PoS)**
Scientific attitudes • pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility • evaluate risks **Analysis and evaluation** • evaluate data, showing awareness of potential sources of random and systematic error	**Development of Scientific thinking** • appreciating the power and limitations of science and considering ethical issues which may rise • explaining everyday and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments • recognising the importance of peer review of results and of communication of results to a range of audiences **Analysis and evaluation** • being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error
KS3 English Programme of Study (DfE National Curriculum PoS)	**KS4 English Programme of Study (DfE National Curriculum PoS)**
Reading Pupils should be taught to: develop an appreciation and love of reading, and read increasingly challenging material independently through: • reading a wide range of fiction and non-fiction, understand increasingly challenging texts through: • making inferences and referring to evidence in the text • knowing the purpose, audience for and context of the writing and drawing on this knowledge to support comprehension • checking their understanding to make sure that what they have read makes sense. read critically through: • knowing how language, including figurative language, vocabulary choice, grammar, text structure and organisational features, presents meaning	**Reading** Pupils should be taught to: read and appreciate the depth and power of the English literary heritage through: • reading a wide range of high-quality, challenging, classic literature and extended literary non-fiction, such as essays, reviews and journalism. This writing should include whole texts. understand and critically evaluate texts through: • reading in different ways for different purposes, summarising and synthesising ideas and information, and evaluating their usefulness for particular purposes • drawing on knowledge of the purpose, audience for and context of the writing, including its social, historical and cultural context and the literary tradition to which it belongs, to inform evaluation • seeking evidence in the text to support a point of view, including justifying inferences with evidence • distinguishing between statements that are supported by evidence and those that are not, and identifying bias and misuse of evidence • making critical comparisons, referring to the contexts, themes, characterisation, style and literary quality of texts, and drawing on knowledge and skills from wider reading • make an informed personal response, recognising that other responses to a text are possible and evaluating these.

PSHE
(DfE National Curriculum PoS)

Online and media
- their rights, responsibilities and opportunities online, including that the same expectations of behaviour apply in all contexts, including online.
- about online risks, including that any material someone provides to another has the potential to be shared online and the difficulty of removing potentially compromising material placed online.
- not to provide material to others that they would not want shared further and not to share personal material which is sent to them.
- what to do and where to get support to report material or manage issues online.
- how information and data is generated, collected, shared and used online.

Internet safety and harms
- that the similarities and differences between the online world and the physical world, including: the impact of unhealthy or obsessive comparison with others online (including through setting unrealistic expectations for body image), how people may curate a specific image of their life online, over-reliance on online relationships including social media, the risks related to online gambling including the accumulation of debt, how advertising and information is targeted at them and how to be a discerning consumer of information online.
- how to identify harmful behaviours online (including bullying, abuse or harassment) and how to report, or find support, if they have been affected by those behaviours.

Behaviour Change Theory links

BCT 1.2   Problem solving
BCT 5.1   Information about health consequences
BCT 9.2   Pros and cons
BCT 9.3   Comparative imagining of future outcomes
BCT 16.3 Vicarious consequences

Lesson 6
Misinformation

Objectives

At the end of this lesson students should be able to:
- Identify fake news and its purpose
- Describe how misinformation impacts individuals and society
- Explain why it is important to check how good (quality), relevant and sufficient the evidence is
- Suggest ways we can identify misinformation

Hook

Watch the video clip introducing COVID-19 fake news:
https://www.youtube.com/watch?v=P92DjNbcndE
(N.B. first 1.30 mins only)

Activities:

‼️This lesson could raise some sensitive issues and awareness is needed as students or their family members may believe in some of the fake news/misinformation. Introduce the lesson and share the objectives with the students. Individuals record how confident they are for each of the objectives at the start of the lesson.

Starter

Activity 1: What is fake news?   **Time: 5 minutes**

We are curently being bombarded with lots of information from lots of different sources and we keep hearing people using the term 'fake news', but what does it mean? Students add to the mind-map everything they already know about fake news. You can use the video to prompt students if needed: How to detect fake news on the coronavirus | #InThisTogether – YouTube https://www.youtube.com/watch?v=P92DjNbcndE

Examples of COVID-19 fake news: *The virus was probably made in a lab. Drinking bleach can kill the virus inside you. Eating garlic protects you. 5G networks spread the virus. The vaccine contains a microchip. Wearing masks can cause CO2 poisoning.*

There are more examples you can use on: BBC video on COVID Myths: Coronavirus: Health claims debunked - BBC News https://www.bbc.co.uk/news/av/52369688

WHO COVID-19 Myths-busters: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters

COVID-19 Vaccine: Latest News & Fact Checks | Snopes.com https://www.snopes.com/tag/COVID-19-vaccine/

Extension for students who need stretching - produce their own examples and definition of fake news.

Lesson 6
Misinformation

Main

Activity 2: What is the difference between misinformation and disinformation?

Time: 5 minutes

Introduce the key terms: Fake news, Disinformation, Misinformation and discuss the differences.

Students write their own definitions for the key terms in their booklets.

Disinformation or fake news refers to articles or posts that appear to be factual, but which contain intentional lies, pretending to be facts, which are intended to influence people, attract viewers, or deceive them.

Misinformation is false or inaccurate information that is mistakenly or inadvertently created or spread; the intent is not to deceive.

Lesson 6
Can you Identify Misinformation?

Activity 2: What is misinformation and disinformation?
Write your own definitions for the key words:

Fake News =

Disinformation =

Misinformation =

Activity 3: What does misinformation look like?
Give two examples of misinformation in the table below:

Example of misinformation	Where could it be found?	Who might start it?	Why? What is its purpose?

Lesson 6
What's the Problem?

Activity 4: What's the problem?
Discuss the following questions below

How does it make you feel?

What could it lead to?

Who should take responsibility?

How can we spot misinformation?

What can we do about it?

Activity 5: Top tips to check?
Think about how you could check for yourself if an article is **reliable** and **trustworthy**, write down your top three tips you would advise a friend on how to check:

.

.

.

Main

Activity 3: What does misinformation look like?

Time: 20 minutes

Using the examples on the PowerPoint students discuss the following questions : *'Where can you find misinformation?'* Students consider which sources are trustworthy and which are least trustworthy, explaining why. *'What is its purpose?'* Show the short video clip from Internet Citizens, ask students if they can think of any more examples. *'Who spreads it?'* Students think about the different reasons why different people may want to spread misinformation and how it can then spread. For example: Joker - shared as a joke, but can be taken out of context. Scammer - trick people into giving away money or personal details. Politicians - misleading claims from government officials to appeal to their supporters, for political gain. Conspiracy theorist - shares an unproven theory believing it to be true. People who might spread it could be: Relatives & Friends - spreads through group chats and social media. Celebrity - famous faces post fake or misleading claims on social media or TV, can be mistaken as them endorsing the misinformation. Super spreaders - celebrities or politicians with large audiences who share things without checking or thinking, to get as many likes as they can. *'How does it spread?'* Explaining how echo chambers and filter bubbles work.

Students choose two examples of misinformation to complete the summary table in their booklets**.**

Lesson 6
Misinformation

Main

Activity 4: What's the problem?

Time: 20 minutes

We use a lot of different sources of information and we need to be able to judge if they are reliable and trustworthy before we can make any decisions. The problem is you can't just believe what you see and should always ask the question *'Do I believe this?' 'How do I know?' 'What is the evidence to support this claim?'*

Watch the WHO animation on the PowerPoint and then in small groups students discuss the following questions: *'How does it make you feel?' 'What could it lead to?' 'Who should take responsibility?' 'What can we do about it?' 'How can we spot misinformation?'*

Using the 'Can you spot the signs of fake news?' quiz on the powerPoint, highlight how we can check if an article is reliable and trustworthy.

Share another example of misinformation and ask the students: *'Why have you decided that this headline is fake?' 'What specific part of the headline seems to be fake?' 'What are real news sources more likely to have?' 'What do you notice about the language used in the fake news headlines?'*

Plenary

Activity 5: Top tips to check?

Time: 10 minutes

Ask students and discuss *'What kind of criteria do we use to check information in the media and online?'*
i.e. we should be looking at the quality of the evidence, the sufficency of evidence and the relevancy of it.

Summarise how we can check and what we should all consider before we believe what is written in an article:
*   Source is trustworthy - *'Who made ,wrote or published it?' 'Have you heard of the organisation that published the story?' 'Are they a trustworthy source?'*
*   Evidence is reliable – *'Does the story sound believable?' 'Is the evidence reliable?' 'Where/who did the news come from?' 'Are there facts to support it or is it just opinion?' 'Can the information be found on other websites?' 'Do photos or videos look normal?' 'Google search the images'.*
*   Website is genuine – *'Does it look genuine?' 'Check the website address, does it look real?' 'Are there any spelling mistakes?' 'Check the dates', 'Do the headlines provoke emotions?'*
*   Evidence is sufficient - *'Is there more than one piece of informationused to support the story?' 'Is the informationbased on evidence from research studies or other people's opinion?'*
*   Evidence is relevant - *'Is there a direct link between the evidence used to support the stiry and the conclusions made?'*

Students think about how they could check themselves if an article is reliable and trustworthy, and write down their own top three tips they would advise a friend on how to check if an article is reliable and trustworthy.

Students refer back to the lesson objectives and complete the assessment for learning activity in the orange boxes, feedback and share an interesting fact they have found out from the lesson.

Remind students about using the LifeLab app they downloaded

Resources

*   Lesson 6 PowerPoint slides
*   Student booklet pages 48-51

Keywords

*   fake news
*   disinformation
*   misinformation
*   reliability
*   trustworthy

Your Scientific Health Investigation
Curriculum Links

KS3 Science Programme of Study (DfE National Curriculum PoS)	KS4 GCSE Science Programme of Study (DfE National Curriculum PoS)
Scientific attitudes • pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility • understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review • evaluate risks **Experimental skills and investigations** • ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience • make predictions using scientific knowledge and understanding • select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent and control variables • use appropriate techniques, apparatus and materials during fieldwork and laboratory work, paying attention to health and safety • make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements • apply sampling techniques **Analysis and evaluation** • apply mathematical concepts and calculate results • present observations and data using appropriate methods, including tables and graphs • interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions • present reasoned explanations, including explaining data in relation to predictions and hypotheses • evaluate data, showing awareness of potential sources of random and systematic error • identify further questions arrising from their results **Measurement** • understand and use SI units • use and derive simple equations and carry out appropriate calculations • undertake basic data analysis including simple statistical techniques	**Development of Scientific thinking** • the ways in which methods and theories develop over time • using a variety of concepts and models to develop scientific explanations and understanding • appreciating the power and limitations of science and considering ethical issues which may arise • explaining every day and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments • evaluating risks both in practical science and the wider societal context, including perception of risk • recognising the importance of peer review of results and of communication of results to a wide range of audiences **Experimental skills and strategies** • use scientific theories and explanations to develop hypotheses • plan experiments to make observations, test hypotheses or explore phenomena • apply knowledge of a range of techniques, apparatus and materials to select those appropriate to the experiment • carry out experiments appropriately, having due regard to the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations • recognise when to apply a knowledge of sampling techniques to ensure any samples collected are representative of the whole population • make and record observations and measurements using a range of apparatus and methods • evaluate methods and suggest possible improvements and further **Analysis and evaluation** • apply the cycle of collecting, presenting and analysing data including; • present observations and data using appropriate methods • translating data from one form to another • carrying out and representing mathematical and statistical analysis

KS4 GCSE Science Programme of Study (DfE National Curriculum PoS) continued.....

- representing distributions of results and estimations of uncertainty
- interpret observations and data including identifying patterns and trends, make inferences and draw conclusions
- present reasoned explanations including relating data to hypotheses
- being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error
- communicating the scientific rationale for investigations, including the methods used, the findings and reasoned conclusions, using paper-based and electronic reports and presentations

Vocabulary, units, symbols and nomenclature
- developing their use of scientific vocabulary and nomenclature
- recognising the importance of scientific quantities and understanding how they are determined
- use SI units
- use prefixes and powers of ten for orders of magnitude (e.g. kilo, centi, milli, micro, nano)
- interconverting units
- using appropriate number of significant figures in calculations

KS3 Biology subject content (DfE National Curriculum PoS)	KS4 Biology subject content (DfE National Curriculum PoS)
Nutrition and digestion • the consequences of imbalance in the diet, including obesity, stravation and deficiency diseases **Gas exchange systems** • the impact of exercise, asthma and smoking on the human gas exchange system	**Health, disease and the development of medicines** • the relationship between health and disease • non-communicable diseases • the impact of lifestyle on the incidence of non-communicable diseases

PSHE
DfE National Curriculum PoS)

Physical health and fitness
- the risks associated with an inactive lifestyle (including obesity)
- the positive associations between physical activity and promotion of mental wellbeing, including as an approach to combat stress
- the characteristics and evidence of what constitutes a healthy lifestyle, maintaining a healthy weight, including the links between an inactive lifestyle and ill-health, including cancer and cardio-vascular ill-health

Behaviour Change Theory links

BCT 1.1   Goal setting (behaviour)
BCT 1.2   Problem solving
BCT 1.3   Goal setting (outcome)
BCT 1.4   Action planning
BCT 1.5   Review behaviour golas
BCT 1.6   Discrepancy between current behaviour and goals
BCT 1.7   Review outcome goals
BCT 1.8   Behavioural contract
BCT 1.9   Commitment
BCT 2.3   Self-monitoring of behaviour
BCT 2.4   Self-monitoring of outcomes of behaviour
BCT 2.7   Feedback on outcomes of behaviour
BCT 3.1   Social support (unspecified)
BCT 3.2   Social support (practical)
BCT 3.3   Social support (emotional)
BCT 11.2   Reduce negative emotions
BCT 13.1   Identification of self as role model

Planning Your Scientific Health Investigation

Objectives

At the end of this activity students should be able to:

- Formulate their own question to investigate health
- Design and construct a plan for their own scientific health investigation
- Safely carry out their scientific health investigation
- Record reliable, precise and accurate data
- Make a conclusion based on the evidence collected

Hook

Examples of questions previously investigated on lesson PowerPoint.

Activities:

Introduce the activity and share the objectives with the students. Individuals record how confident they are for each of the objectives at the start of the activity.

Starter

Activity 1: What question on health are you going to investigate?

Discuss with students and remind them how the scientists approached their studies in the Southampton Women's Survey and the TeC-19 Study. Then pose the question *'How could you investigate your health?'* Be as open as possible and try to encourage them to be imaginative.

- In small groups revisit the question they have decided to investigate on health, checking they have decided how they will make their measurements and what resources they will need. LifeLab is happy to support with resources if possible and given enough planning time.
- Feedback to the whole class from each group, sharing ideas for their investigation. Students should be free to decide their own question. Ideally, each group will answer a different question.
- Class discussion sharing any problems/questions they may have come across and how they have solved them.
- Students discuss how scientists carry out investigations; aim/hypothesis, collecting reliable / accurate / precise data, controlling variables etc. Another chance to re-enforce these keywords in a context in which they have some personal investment. Encourage students to use different types of data for their investigations (i.e. they could data on opinions, habits from peers) not just 'quantitative' data.

Introduce the CREST Bronze Award. Stress that this isn't extra work, it is included in the work they do as part of their investigation.

Planning Your Scientific Health Investigation

Main

Activity 2: Planning our own scientific health investigation

Time: variable, teacher's discretion

Students plan their own investigation and carry out their investigation, collecting and recording data.
Analyse and draw conclusions based on the evidence collected from their investigations.

N.B. if students wanted to do a sport/exercise related investigation this could be done in conjunction with, or as part of, a PE lesson.

Plenary

Students evaluate their findings.
'Do they trust their data? What would they go on to do now? Would they repeat their investigation? Would they change anything?'
Students need to complete the CREST Award checklist included in the teacher's resource pack if they wish to submit their poster for a Bronze award.
Students refer back to the lesson objectives and complete the assessment for learning activity in the orange boxes, feedback and share an interesting fact they have found out from the lesson.

Remind students about using the LifeLab app

Homework

Students decide in their groups which person is responsible for writing each section of their scientific health investigation poster (introduction/method/results/discussion/images etc). They then prepare their section for homework.

Resources

- Your Scientific Health Investigation PowerPoint slides
- Student booklet pages 52-54
- Bronze CREST Award checklist (on teachers memory stick)
- Electronic or hardcopy of poster template

Keywords

- hypothesis
- evidence
- precision
- accuracy
- repeatability

Presenting Health Data

Objectives

At the end of this lesson students should be able to:
- Present their results from their investigation as a scientific health investigation poster
- Evaluate their scientific health investigation posters

Hook

Show examples/photos of some science posters.
Look around your Science Lab.
Can you see any more examples?

Activities:

Introduce the lesson and share the objectives with the students. Individuals record how confident they are for each of the objectives at the start of the lesson.

Starter

Science posters vs Scientific investigation posters   **Time: 5 minutes**

Discuss what is the difference between a science poster and a science investigation poster.

Brainstorm: *'What is a science poster? What does it look like? What is its purpose? What is the audience? Why would scientists choose to present their findings like this?'*

Show students some examples of 'scientific investigation posters' - some from scientists and some from LifeLab students who have produced scientific investigation posters.

The idea isn't that the students will be able to understand the scientific investigation posters, but more that they can discuss how the data, graphs, method and findings are presented along with references.

Presenting Health Data

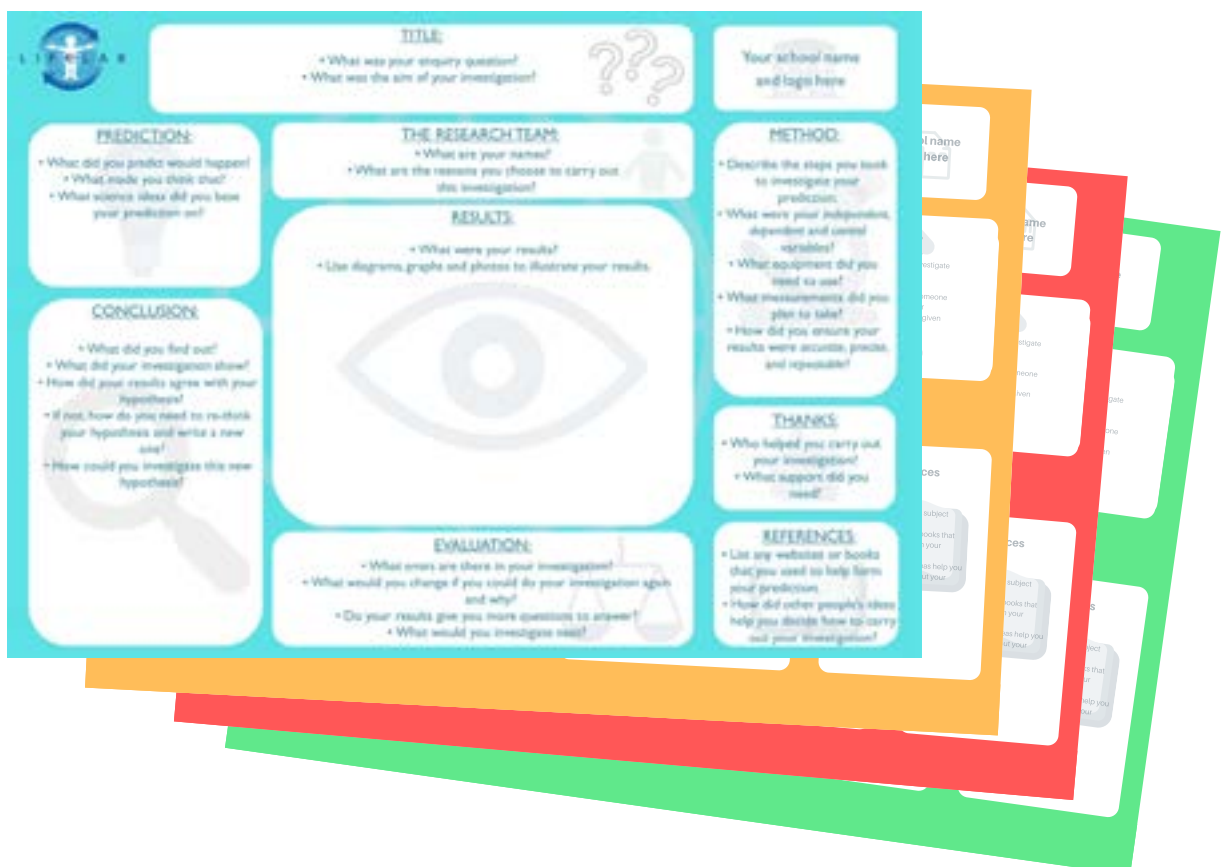### Scientific Health Investigation Posters

Design your own scientific health investigation poster
Using the poster template, make your own poster to show your health investigation.

Judging your scientific health investigation posters
Discuss how you are going to judge the posters and agree the criteria.
What are you going to give marks for? What are you looking for? How are you going to decide which poster should go to the LifeLab Schools' Conference?

55

Main

Activity 1: Design your own Scientific Health Investigation Poster

Time: variable, teacher's discretion

Using the poster templates given in PowerPoint or the printed versions, the students, in groups, produce their own scientific investigation poster.

The key points the students need to think about are: audience, presentation of actual data, how to make a poster look interesting (not too much text, more images, but relevant images), authors, addresses, logos, acknowledgements, references, the structure of the poster with aim/hypothesis/method/results/conclusion etc.

Each member of the group could write a different section (possible homework from previous lesson). Perhaps include any images/results of the LifeLab activities if appropriate.

The PowerPoint templates given can be modified in any way the students want eg. Colour/background/layout etc.

NB there is a good opportunity here to link to English and Maths with numeracy and literacy skills being used for data analysis and write up/presentation.

Presenting Health Data

Plenary

Activity 2: Judging your Scientific Health Investigation Posters   **Time: variable**

Students need to think about a list of points/criteria to consider using when judging the posters. Discuss how the students are going to judge the posters, agree the criteria.
'What are they going to give marks for? What are they looking for? How are they going to decide which poster should go to the LifeLab Schools' Conference/Showcase?'
This could lead into an extension lesson, where the students can have a mini conference and then decide which posters are the "best" and should be presented at the LifeLab schools' conference/showcase.
Students refer back to the lesson objectives and complete the assessment for learning activity in the orange boxes, feedback and share an interesting fact they have found out from the lesson.

N.B. Teachers need to arrange printing of the posters; they are best printed out on A3.
For those selected to submit for a Bronze CREST award you will need to send the teacher's checklist per poster and an electronic copy of the student poster as evidence to LifeLab. LifeLab will invoice you for the CREST certificates that are awarded per student. The three posters sent for the showcase will be paid for by LifeLab.

Remind students about using the LifeLab app

What is a Scientific Health Conference?

Many scientists from the University of Southampton and throughout the United Kingdom are working to understand more about how we can make sure people have a Healthy Start to Life. They work with scientists in universities all around the world who belong to the International Society for **Developmental Origins of Health and Disease, (DOHaD)**.

Every year the DOHaD scientists from across the world meet to talk about what they have been doing. They talk about their work and share ideas, and learn from each other. **Collaboration and team work are important for scientists.**

The University of Southampton Institute of Developmental Sciences, University Hospital Southampton

At a conference, scientists will either give a talk or present a poster. After a talk or a poster presentation there is time for questions from the audience.

The scientists also have a journal where they can send reports about their work. The reports have to be reviewed by other scientists and then approved by the editor before they can be published. Scientists from all around the world read journals to find out about what other scientists are doing.

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Extension

Holding your scientific health conference
Time: variable, teacher's discretion
Watch the video clip from a scientific conference and discuss what goes on at a science conference.
http://m.youtube.com/watch?feature=related&v=Jm1qTR22XPo

Discuss with students what scientists do at scientific health conferences, *'What is the purpose of holding scientific health conferences? What are the benefits for the scientists?'*
Recap on how the students are going to judge the posters and confirm the criteria.
'What are they going to give marks for? What are they looking for? How are they going to decide which posters should go to the LifeLab Schools' Conference?'

Students organise and hold their own Scientific Health Conference, looking at all the posters and award their marks for each one.

Resources

- Your Scientific Health Investigation PowerPoint slides
- Student booklet pages 55-56
- Examples of scientific health investigation posters
- Computer/IT access for electronic poster template **or** A1 paper copies of poster template (available from LifeLab on request)

Keywords

- conclusion
- evaluation
- audience
- acknowledgements
- reference
- conference

Delivering a COVID-19 Health Message
Curriculum Links

RSPH
ROYAL SOCIETY FOR PUBLIC HEALTH
VISION, VOICE AND PRACTICE

LIFELAB

Safety issues	
Potential sensitivity relating to health risks	
KS3 Science Programme of study (DfE National Curriculum PoS)	**KS4 GCSE Science Programme of Study (DfE National Curriculum PoS)**
Scientific attitudes • pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility	**Development of Scientific thinking** • appreciating the power and limitations of science and considering ethical issues which may rise • explaining everyday and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments • evaluating risks both in practical science and the wider social context, including perception of risk • recognising the importance of peer review of results and of communication of results to a range of audiences

KS4 Biology subject content (DfE National Curriculum PoS)
Health, disease and the development of medicines • the relationship between health and disease • communicable diseases • reducing and preventing the spread of infectious diseases • the impact of lifestyle factors on the incidence of non-communicable diseases

PSHE (DfE National curriculum PoS)
Mental wellbeing • where and how to seek support (including recognising the triggers for seeking support), including whom in school they should speak to if they are worried about their own or someone else's mental wellbeing or ability to control their emotions (including issues arising online). **Internet safety and harms** • how to be a discerning consumer of information online including understanding that information, including that from search engines, is ranked, selected and targeted **Physical health and fitness** • how and when to seek support including which adults to speak to in school if they are worried about their health

Behaviour Change Theory links
BCT 1.2   Problem solving BCT 5.1   Information about health consequences BCT 9.2   Pros and cons BCT 9.3   Comparative imagining of future outcomes BCT 16.3 Vicarious consequences

Delivering a COVID-19 Health Message

LIFELAB

Objectives
At the end of this lesson students should be able to:
- Understand why peer advice is important for the delivery of messages around COVID-19
- Carry out preparations for delivering a message
- Deliver a message around COVID-19
- Evaluate the delivery of the COVID-19 message

Hook
Show examples/photos of some COVID-19 health message campaigns
What makes a good campaign?

Activities:
Introduce the lesson and share the objectives with the students. Individuals record how confident they are for each of the objectives at the start of the lesson.

What Role can Young People Play?

LIFELAB

1. Young people can't catch COVID-19
2. Young people are less likely to die as a result of COVID-19
3. Young people can't catch COVID-19, but they can pass it on to others
4. Young people are less likely to be admitted to hospital as a result of COVID-19
5. Children and young people with COVID-19 are more likely than adults to be asymptomatic
6. It's only people in their 80's and 90's who die from COVID-19
7. Children and young people appear to be less likely to catch COVID-19 than adults
8. If you have an underlying health condition you become reallly ill from COVID-19

Activity 1: What role can young people play?
Can you sort the 8 statements above into true or false and give the **evidence or the reasoning** you used to make your choice in the table below:

Statements which are **True**	Statements which are **False**

Who's Advice Would You Listen To?

LIFELAB

Activity 2: Who's advice would you listen to?
The way in which we react to advice and the likelihood of us taking it on board, can often depend on exactly who is giving us that advice.

Imagine that someone was giving you some advice around an aspect of your health. What do you think would be the advantages and disadvantages of receiving that same piece of advice from a **peer** or from an **authority figure** e.g. teacher, parent or other adult?

Advantages of **peer** advice	Advantages of **authority** figure advice
Weaknesses of **peer** advice	Weaknesses of **authority** figure's advice

In what ways can young people play their role in preventing the spread of COVID-19?

58   59

Starter

Activity 1: What role can young people play?
Discuss the importance of young people participating in measures to prevent the transmission of COVID-19: Whilst at lower risk, young people are still able to catch COVID-19 and become ill as a result of it; young people are still able to pass COVID-19 onto family members and others who may be at-risk; symbolic importance of all members of society coming together to follow shared rules.

Activity 2: Where do you get your advice from?
Compare the advantages and disadvantages of providing advice to peers: such as 'talking the same language', similarity of experiences, understanding of barriers or stigma, disadvantages such as not being seen as an expert, lack of experience, lack of authority.
Peer advice vs advice from 'authority' figures: such as parents or professionals such as teachers; willingness to accept advice from peers and resistance to authority figures; perception that authority figures would not understand issues, greater experience of authority figures, resources available to authority figures compared to peers

Planning a COVID-19 Health Message

Main

Activity 3: What is the role of a COVID-19 Young Health Champion?
Discuss with students what a COVID-19 Young Health Champion does and what they cannot help with (boundaries of role); they can provide appropriate government health recommendations around COVID-19; where to find further information; where to seek support. But they cannot offer medical advice and act as subject matter experts.

Your role as a COVID-19 Young Health Champion

Activity 3: What is the role of a COVID-19 Young Health Champion?
When talking to someone in your capacity as a COVID-19 Young Health Champion, it is important that they know what you can do as part of your role. It is equally important that they know what you cannot do as part of your role.

Read the statements below. Tick the boxes that you believe are activities that are covered by your roles and responsibilities as a COVID-19 Young Health Champion:

- Provide someone with a COVID-19 test ☐
- Talk to someone about the importance of measures in place to stop the spread of COVID-19 ☐
- Tell someone whether they have COVID-19, based on their symptoms ☐
- Give someone an instruction to self-isolate ☐
- Explain what the purpose of social distancing is ☐
- Offer advice to someone who is unsure about whether the guidelines apply to them ☐
- Talk about the reasons that can make someone not follow the guidelines ☐
- Act as a substitute for professional medical advice if required ☐

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Preparing your COVID-19 Message

Activity 4: Planning to deliver your COVID-19 health message
Once you have decided on your topic, use the prompts below and record your ideas:

1. What are the **key points** you are covering in your message?

2. How are you going to **deliver** your message? What is the best way to reach your intended audience, what are the advantages and disadvantages?

3. Make a list of all the **resources** you use to help you prepare for your message, including any you are using to sign post your audience to.

4. What **materials** are you making to help deliver your message? Explain why they are suitable for your choosen audience?

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Main

Activity 4: Planning to deliver your COVID-19 Health Message
The following areas below should be covered by students and recorded in their boolet:

- **Key points of the COVID-19 message:** health improvement message is divided into a small number of key points that should be covered in any presentation on the topic.
- **Best-suited delivery method:** Opportunities for delivering the COVID-19 message explored such as assemblies, poster and leaflet campaigns, information stands at local events, social media channels; Merits of each method discussed, including their suitability in reaching the intended audience, the different ways in which information can be presented when using them, the ability of each method to be used to monitor and respond to questions, comments or feedback from delivery
- **Resources:** a range of resources are obtained that are relevant to the peer or group to which the COVID-19 message will be delivered.
- **Prepare materials suitable of the COVID-19 message:** materials are prepared that can be used in the delivery of the COVID-19 message and are suitable and relevant for the chosen peer group.
- **Prepare for anticipated questions, comments and feedback:** A range of potential questions, comments and feedback are identified and discussed with possible responses considered; opportunities to signpost to other sources of reliable information and support identified: potential difference in nature and style of comments typically received through social media and in- person delivery compared and discussed; strategies for managing comments or questions that raise concerns around the wellbeing of a peer discussed with tutor; strategies for knowing how and where to seek support should offensive or upsetting comments be received agreed with tutor/teacher.

Delivering a COVID-19 Health Message

Main

Activity 5: Delivering your Health Message
Students should make sure they cover the following points below: when they deliver their COVID-19 message:
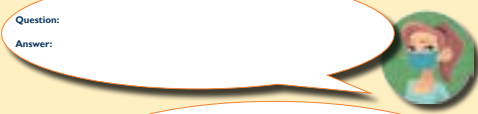- **Explain the role:** reference to roles, responsibilities and boundaries highlighted in Task 3.
- **Present a positive message:** the COVID-19 message is presented to the chosen peer or group, including a rationale or justification of the topic in language that is appropriate to the audience and the topic of COVID-19; the message is presented in a positive manner.
- **Style of delivery:** style of delivery is appropriate to the topic as well as the needs and interests of the target audience.
- **Consider questions, comments and feedback: use of empathy to understand the viewpoint of a respondent;** acknowledgement that COVID-19 and the associated pandemic are complex issues; questions are responded to in an appropriate manner; questions, comments and feedback that raise concerns are passed onto tutor through process agreed in Task 4.
- **Signpost to reliable sources:** Audience signposted to the reliable sources of support and information around COVID-19 identified in Task 4 where necessary.

Delivering your COVID-19 Message

5. Be prepared! What questions might you expect to be asked? Prepare your answers below:

Question:
Answer:

Question:
Answer:

Question:
Answer:

Task 5: Delivering your COVID-19 message
Now that you have designed your message around COVID-19, you will need to deliver it to your chosen audience. You will need to collect some evidence relating to the message that you have developed. This could include:
- an audio or video file of you delivering your message
- examples of the resources you developed
- screenshots of the content of the message, if you are delivering it using social media

Evaluating your COVID-19 Message

Task 6: Evaluating the delivery of your COVID-19 message
Now that you have delivered your message, it is important to evaluate how effective it was to help you think about whether you should do anything differently next time.

There are two essential elements to this; getting feedback and deciding what you want to change.

Complete the grid below with feedback from at least two of the three different sources listed below:

Person providing feedback	Positive areas	Areas to work on and improve
Fellow COVID-19 Young Health Champion		
Audience member		
Teacher		

Plenary

Activity 6: Evaluating the delivery of your COVID-19 message
Students review how affect they think their COVID-19 message was, completing the grid with feedback from at least two of the three different sources.
- **Assess the strengths:** determine which elements of the COVID-19 message went well, including content, pitch, structure, interaction based on feedback from sources such as mentors, peers and audience members.
- **Assess what could be improved:** determine which elements of the COVID-19 message could be improved in areas such as justification of topic, tone, relevance to audience and level of interaction based on feedback from sources such as mentors, peers and audience members.

Resources
- Your COVID-19 Health Message PowerPoint slides
- Student booklet pages 57-58
- Examples of COVID-19 health message campaigns

Keywords
- peer
- authority figure
- signposting

Evaluating Their Health Pledge
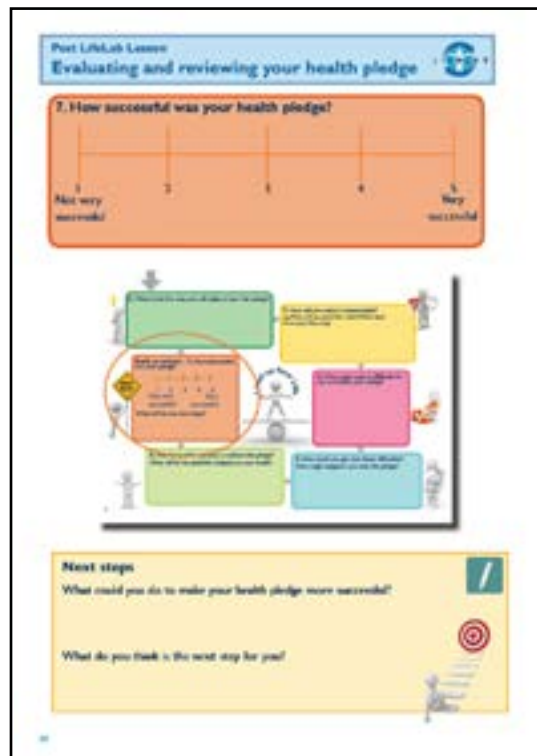
N.B. This is an essential follow up activity at the end of the module

Evaluate their Health Pledge

Time: 10 minutes

Students need to revist their health pledge, using the 'Healthy Conversation Skills' training from the PD day and '***What?***' and '***How?***' questions, draw students into discussion about their health pledge and how they can evaluate it properly.

Discuss, possibly in pairs:

> '***How successful do you feel you were?***'
> '***What were the barriers?***'
> '***How important is it to you that you are successful with your pledge?***'
> '***What could you change about your pledge?***'
> '***What could your next step be?***'

Encourage the students to refer back to their health pledge and use the student booklet to reflect on the long term success of their pledge. They can revise their pledge if they feel they haven't achieved it or they can build upon it/make another if they think they have successfully achieved it.

Remind students about using the LifeLab app

References

LifeLab

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Acknowledgments

LifeLab: Me, My Health and My Children's Health (2021)

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Additional Cross Curricular lessons

Literacy

Numeracy

Physical Education

Food and Nutrition

PSHE - Developing Healthy Habits

Please ask a member of LifeLab staff for more information on LifeLab Ambassadors, Young Health Champions or taking part in the Medics Summer School. Or alternatively email: lifelab@soton.ac.uk

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