



Stile

Waves

How does someone
on the other side
of the world see and
hear you?

Teaching Plan

Communication technology

Phones, tablets and computers are incredible communication tools. How do sound and light travel through these devices so we can see and hear someone across the world?

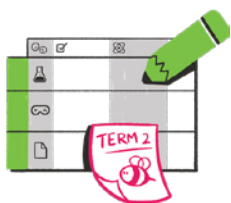
Version 1.0

Everything in one place

Stile is a complete science curriculum. Our digital lessons and hard copy booklets are designed to help students be the best learners they can be and to give you the tools to do what you do best: teach.

Teacher resources

Student resources



Find out everything you need to know from the unit's **Teaching plan** and **Lab Guide**.

- In **Prepare Mode** for each lesson, you can:
 - Read the detailed teaching notes
 - Print a copy to refer to in class
 - Customise resources for the needs of your students

Before class

Stile X phone app

- Front-load the unit's scientific terminology through flashcards and quizzes



Within **Teach Mode** you can:

- Implement explicit teaching with learning goals and Key Questions
- Use videos, images and text to guide your instruction
- Facilitate discussion with live brainstorms and polls
- View student data instantly to inform your teaching

During class

Stile Classroom

- Engage in real-world phenomena through:
 - Labs
 - Projects
 - Lessons
 - Hands-on activities
 - Simulations
 - Engineering challenges
 - Open-ended investigations
 - Extension lessons



To **Analyse** student work:

- View data in Analyse Mode to determine your next teaching steps
- See a bird's-eye view of student progress in the Markbook
- Release model answers to students
- Provide written feedback where it matters most

After class

Stile X booklets

- Consolidate and revise material learned in class by:
 - Creating structured revision notes
 - Recording definitions in the glossary
 - Completing practice test questions

Stile X phone app

- 60-second summary videos recap key ideas from the Stile lesson



Scan here to view **The Stile Guide**, the essential guide to supercharging your teaching with Stile

Storyline and real-world phenomenon

How does someone on the other side of the world see and hear you?

Thanks to new technology, the way we communicate has changed dramatically in the last 30 years. We can now reach out further and faster than ever! But despite our increasing dependence on this technology, few of us understand how it works.

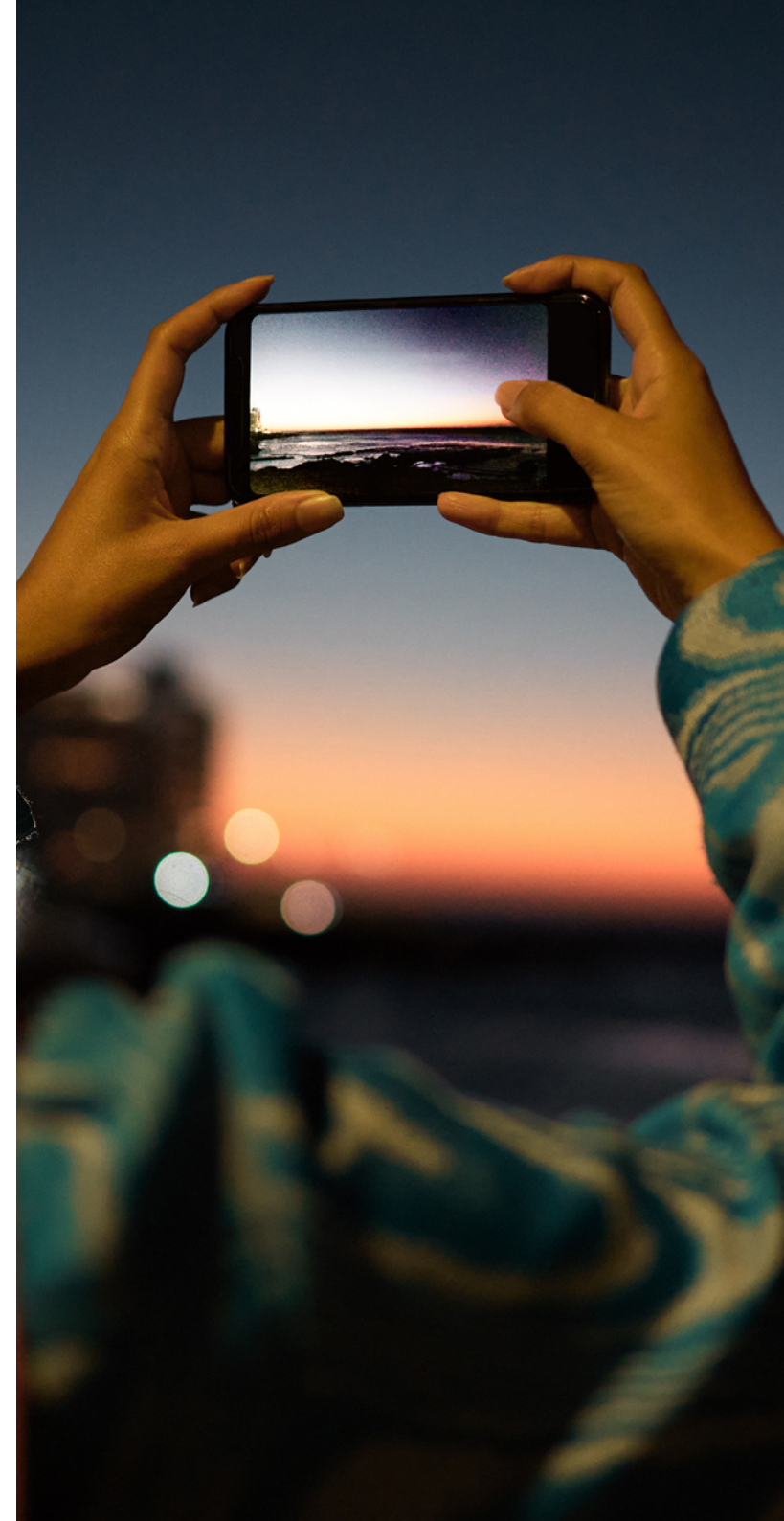
In this unit, students develop models of global telecommunication by investigating how a round-the-world video call works. To explain this phenomenon, they examine how sound and light waves transfer information to digital devices like smartphones. As they progress through the unit, they revise their models to reflect their growing understanding of sound and light energy.

Big ideas

- How do sound and light waves transfer energy?
- How do sound and light interact with different materials?
- How can we use models to understand the flow of energy and information?
- What are the advantages of digital signals over analogue signals?
- How can we help bridge the digital divide?

Highlights













- Develop models to explain global telecommunication
- Complete group challenges to communicate without sound or digital devices
- Use simulations to investigate the properties of sound and light
- Explain why a red gummy bear stops a green laser in its tracks
- Model how information is sent over the internet via fibre-optic cables or satellite systems like Starlink
- Create a social media post to raise awareness about the digital divide
- Write programs for pocket-sized computers to send Morse code messages




This unit at a glance

 This unit is designed to take five and a half weeks, with four 45-minute class sessions per week.

Legend

-  Lesson
-  Extension lesson
-  Practical activity
-  Activity
-  Simulation
-  Breaking news
-  Engineering challenge
-  Research project
-  Glossary
-  Quiz
-  Open-ended investigation
-  Optional lesson

 This icon indicates lessons that have additional revision and consolidation material available in **Stile X**, our hard-copy study booklet and accompanying app.

*The Stile X booklet for this unit will be available for the 2024 school year.

Students **activate prior knowledge** about light, sound and colour in this **formative assessment**.







Students apply their learning so far to **revise and improve** their models of global communication.

Regular **formative assessment** provides a quick check of student progress at pivotal points in the unit.



This **summative assessment** assesses students' **curriculum-aligned** knowledge.

Waves








 Pre-test: Waves

-  1. Shining a light on communication
-  Micro:bit Lesson 1: Light into sound
-  2. Modelling global communication
-  3. Sound
-   4. Wave properties





 Check-in #1


-   5. Reflection
-   6. Refraction
-  Updating our models
-   7. Brightness
-   8. Colour
-   9. How light interacts with objects

 Check-in #2

-   10. The electromagnetic spectrum
-   11. Radio waves
-  Micro:bit Lesson 2: Morse code via radio waves
-   12. Digital signals

 Check-in #3

-  13. Satellite communication
-  14. Long-distance communication
-  15. Re-modelling global communication
-  16. Bridging the digital divide

-  Glossary
-  Test: Waves

Students engage in the **real-world phenomenon** of communication technology by creating and testing a solution to communicate across the room.

Students **work collaboratively** to **propose a model** of how global communication works.

Students **explore explanations** for the loss of internet connection in Tonga following a volcanic eruption.

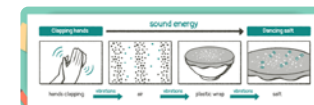
Unit storyline

Throughout this unit, students engage with wave and particle models to understand light and sound. They use the context of communications technology to unpack how sound and light are carried around the world through video calls. Multiple phenomena contribute to the development of scientific skills and understanding. The progression of these phenomena, and how they are observed within lessons, is detailed below.

Phenomenon	Lesson	Phenomenon	Lesson
Communicating without sound or technology	<p>Lesson 1: Shining a light on communication</p> <ul style="list-style-type: none"> Students are introduced to the central theme of the unit – the use of waves in communication technology – and start modelling communication systems They create and test a solution for communicating across the room using light, and test their solution in a scenario where line-of-sight is obscured 	Dancing salt	<p>Lesson: 3. Sound</p> <ul style="list-style-type: none"> Students learn about sound and how it travels through mediums to explain the first step of their model – how their voice gets to their phone They engage in a “Dancing Salt” activity to understand the role of vibrations in the transfer of sound energy
A video call between people on opposite sides of the world	<p>Lesson: 2. Modelling global communication</p> <ul style="list-style-type: none"> Students build on their understanding of communication across a room to ponder the real-world phenomenon of a video call between people on either side of the world They work collaboratively on a group model to explain this phenomenon, annotating each step with their thoughts and questions to create a Driving Questions Board 	Rubens tube	<p>Lesson: 4. Wave properties</p> <ul style="list-style-type: none"> Students explore the phenomenon of a Rubens tube to understand the wavelike properties of sound They use a simulation to independently investigate the relationship between pitch, wavelength and frequency, as well as volume and amplitude

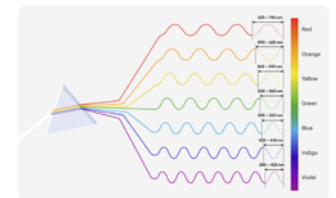
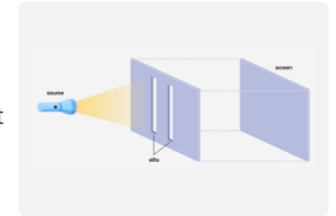


Fast, reliable communication around the world is important to many of us. Have you ever stopped to wonder how it works?



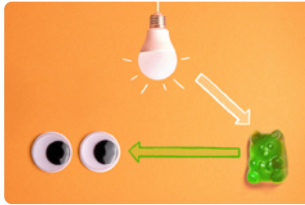
Unit storyline

Phenomenon	Lesson	Phenomenon	Lesson
Visual occlusion	Lesson: 5. Reflection <ul style="list-style-type: none"> Students consider light's role in capturing images and sending information about the appearance of objects They investigate how light reflects off different objects, and use models to explain how light reflects off their faces towards their phone's camera 	Double-slit experiment	Lesson: 7. Brightness <ul style="list-style-type: none"> Students apply an understanding of amplitude, wavelength and frequency to light waves to explain the double-slit experiment They apply their understanding of the wave properties of light to account for changes in brightness in the images captured by their phones
Images of large objects captured on tiny sensors	Lesson: 6. Refraction <ul style="list-style-type: none"> Students investigate changing the size of an image with and without a lens, and how the properties of lenses affect how light refracts using a simulation They explain, using refraction, how a lens can change the size of an image to capture a large object on a tiny light sensor in their phone 	Splitting white light through a prism	Lesson: 8. Colour <ul style="list-style-type: none"> Students explore light refraction through prisms using an interactive to understand colours according to the wave model of light They apply their understanding of wavelength and frequency to explain the different colours in the video images they are sending across the world







Unit storyline

Phenomenon	Lesson	Phenomenon	Lesson
A red gummy bear stopping a green laser beam in its tracks	<p>Lesson: 9. How light interacts with objects</p> <ul style="list-style-type: none"> Students investigate lasers interacting with different coloured gummy bears to explain how the absorption and reflection of particular wavelengths of light make objects appear coloured They use a simulation to investigate how filters affect coloured light and extend their understanding of colour perception to the pixels on their phone screens 	Phone to cell tower communication	<p>Lesson: 11. Radio waves</p> <ul style="list-style-type: none"> Students examine why radio waves (and microwaves) are useful for long-distance communication They explore features of the electromagnetic spectrum and examine the advantages of radio waves for sending messages from their phones to cell towers
Herschel's "invisible energy" experiment	<p>Lesson: 10. The electromagnetic spectrum</p> <ul style="list-style-type: none"> Students explore the next step in explaining video calls by considering how information is sent from their phones to cell towers They discover visible light is just one type of electromagnetic radiation and explore features of the electromagnetic spectrum 	Signal loss and noise on analogue and digital devices	<p>Lesson: 12. Digital signals</p> <ul style="list-style-type: none"> Students compare analogue and digital information to explain why digital signals are a more reliable way to transfer information from their phones across the world They examine differences between analogue and digital inputs and outputs, and draw and compare models of analogue and digital signals



Unit storyline

Phenomenon	Lesson	Phenomenon	Lesson	
Tonga's loss of the internet following the 2022 volcanic eruption	<p>Lesson: 13. Satellite communication</p> <ul style="list-style-type: none">Students explore the next link in their communication model – how information gets from cell towers to other parts of the world via satellitesThey explore explanations for why Tonga lost access to the internet following a volcanic eruption in 2022 and the role satellite tech played in reconnecting them		<p>Lesson: 15. Re-modelling global communication</p> <ul style="list-style-type: none">Students complete their final model explaining the phenomenon of a long-distance video callThey resolve their Driving Question Boards and reflect on the future of communication from a personal, social and global perspective	
Optic-fibre lamps	<p>Lesson: 14. Long-distance communication</p> <ul style="list-style-type: none">Students explore how optical fibres are used for most present-day long-distance communicationThey model satellite internet and fibre internet, explain the key differences between them and discuss the advantages and limitations of each type of communication for promoting fair access to the internet		<p>Lesson: 16. Bridging the digital divide</p> <ul style="list-style-type: none">Students discover more about the digital divide and why it's an important social issueThey discuss the digital divide and research one aspect of the problem and a potential solutionThey create a social media post to communicate their key discoveries	

Curriculum alignment

This unit focuses on wave and particle models of energy transfer. Detailed alignment information can be found at the links below.



[Click here](#) to view curriculum alignment for Version 8.4 of the Australian Curriculum



[Click here](#) to view curriculum alignment for Version 9 of the Australian Curriculum



[Click here](#) to view alignment for the NSW Syllabus for the Australian Curriculum



[Click here](#) to view curriculum alignment for the Victorian Curriculum

Prior knowledge

This unit is written with the assumption that students have some existing subject knowledge.

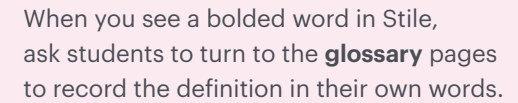
Before beginning this unit, students should be familiar with:

- Identifying sources of light (Primary School [Light](#) unit)
- Recognising that light travels in a straight path (Primary School [Light](#) unit)
- How shadows are formed (Primary School [Light](#) unit)
- The idea that light can be reflected and refracted (Primary School [Light](#) unit)
- Energy transfer and transformation in simple systems ([Energy](#) unit)

What's in the Stile X booklet?

- Wave properties
- Reflection
- Refraction
- Brightness
- Colour
- How light interacts with objects
- The electromagnetic spectrum
- Radio waves
- Digital signals

Read **expert study tips** aloud and discuss them in class to help students build important study skills.



- Explain how different sounds can be modelled using wave properties
- Explain how the path of light determines which objects we can see
- Explain how materials can be used to change the path of light
- Explain the result of the double-slit experiment using the wave model of light
- Explain colour and brightness by applying the wave model of light
- Model how light interacts with objects of different colours
- Explain how an object's material affects the way light interacts with it
- Explain why light waves can be transmitted through empty space
- Justify which type of wave is best for long-distance communication
- Explain whether digital or analogue signals are more reliable for sending information

Assessment

Stile's assessment tasks require students to apply general capabilities, skills and knowledge to explain phenomena and solve problems. We recommend using the formative assessment opportunities listed to gauge student progress, which will guide your next teaching steps. Self-assessment opportunities are also included in both Stile and Stile X to encourage metacognitive monitoring. Summative assessment tasks are designed to show what a student has learned throughout the unit and can be used to inform your reporting.

Formative assessment

Key Questions

A Key Question is an opportunity for students to demonstrate their progress against a learning goal. Stile lessons include one Key Question for each learning goal. Using the in-class analytics available in Teach Mode, you can use Key Questions to make quick, frequent judgements about student progress. We strongly recommend that you focus on these questions when providing feedback.



Check-ins

Three check-in lessons have been included as formative assessment opportunities in the unit. Check-ins contain self-marking multiple choice and drag and drop questions that will give you a quick snapshot of student learning at pivotal points in the unit. Student results in a check-in assessment will help you determine whether students are ready to progress to the next phase in the learning cycle, or whether further teaching is required.

Lesson type	Lesson name	Question types	Time
Check-in	Check-in #1	Multiple choice, drag and drop	15 minutes

Check-in	Check-in #2	Multiple choice, drag and drop	15 minutes
Check-in	Check-in #3	Multiple choice, drag and drop	15 minutes

Summative assessment

Test

This unit contains a test to provide summative assessment of student learning across the whole unit.

Lesson type	Lesson name	Question types	Time
Test	Test: Waves	Multiple choice, drag and drop, written response	45 minutes

Scientific skills

One project within this unit can be used as a summative assessment of science inquiry skills.

Lesson type	Lesson name	Question types	Time
Research project	16. Bridging the digital divide	Drag and drop, table, written response, open response	45 minutes

Important things to know about this unit

Driving Questions Board



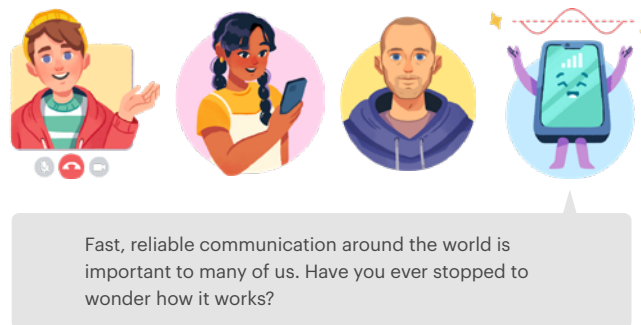
The Driving Questions Board is a visible record of questions generated by students as they develop the curiosity that drives their learning throughout the unit. At the end of lesson 2. Modelling global communication, students will create Driving Questions Boards in groups.

Throughout the unit, you'll be prompted to ask students to return to their boards and encourage them to review their thoughts, consider what they've learned, answer any questions, and formulate new ones. We encourage you to refer to the boards as you start and finish lessons to help students connect their questions to their learning.

Read more about Driving Questions Boards and how to use them in our blog post at stileapp.com/go/dqbblog.

Character conversations

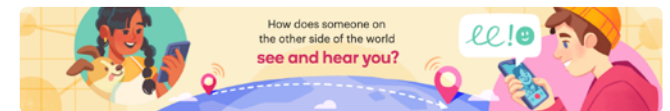
Elina, Lucca, Nigel and Moby the mobile phone are characters included throughout the unit. Speech bubbles are used as a bridge between sections of the lesson and to provide light humour. Where character conversations appear, they should be read in the same way as other sections of text. You might read the conversations aloud, or ask students to “play” the role of a specific character within the lesson.



The role of the Guiding Question

Student curiosity and questioning drive the learning in this unit. Students frequently contribute their questions to the Driving Questions Board, and these questions are drawn upon to drive the learning from the students' perspectives. The Guiding Question, “How does someone on the other side of the world see and hear you?” is introduced in Lesson 1. It acts

as a support around which you can facilitate discussion, and support students to connect their own questions to the targeted materials.



Learning goals

While student curiosity and questioning drive the learning, the design of the unit as a whole supports students to make sense of phenomena and model their understanding. The use of learning goals guides them toward specific outcomes in each lesson, so that their learning builds toward understanding the phenomenon and designing a solution to the problem. Evidence shows that students who know what is expected of them are more likely to engage in the learning process and achieve better learning outcomes (Hattie, 2012). These goals are introduced following an initial opportunity for students to explore the phenomenon, so that the opportunity for inquiry is maintained.

Your learning goal...

By the end of this lesson, you will be able to:

1. Create a model to communicate a problem and potential solutions



Important things to know about this unit

Parent email template

This unit includes a pre-written email template that you can use to inform parents about what students are learning in class. You'll find a link to this template in the teacher notes at the bottom of the unit's folder in your Stile subject or you can go to stileapp.com/go/parentemailwaves

Copy the text, paste it into an email, and modify it to suit. This is a great way to bridge the gap between school and home, and engage parents in their child's learning.

Lab Guide

A guide to the lab activities in this unit is linked in the teacher notes at the bottom of this unit's folder in your Stile subject or you can go to stileapp.com/go/wavesaulabguide

This document includes the materials and method for each of the hands-on activities in the unit. It also includes links to the relevant RiskAssess templates and guidance to set up and run each activity. The relevant pages are included in the teaching notes for hands-on and practical activity lessons.

Micro:bit lessons

This unit includes two optional hands-on activities that use micro:bit pocket computers. If you have access to micro:bit pocket computers, this is an excellent opportunity to integrate Digital Technologies and enhance the learning experience with an additional hands-on element. If you don't have access to these devices, the storyline of the unit will be unaffected if the lessons are omitted. Micro:bits can be purchased from most online electronics retailers. Search "buy microbit" for your closest supplier.



Using lessons in isolation

This unit has a storyline, with each lesson an integrated part of that story. However, we understand that sometimes you want to run a lesson as a stand-alone. In this instance, we recommend editing or removing the character conversations that start each lesson. They often serve the purpose of connecting to the previous lesson in the sequence. Consider adding custom introductory text and images to these lessons to establish the context for your needs.

Light and colour poster





















This unit has an accompanying poster about light and colour, available for purchase from the [Stile Shop](https://www.stile.com.au/stile-shop). Display this poster on your classroom wall to help students appreciate the amazing beauty and power of light and the science behind it.



Lesson Planning Guide




























The guide below is based on four 45-minute sessions per week.

[Click here](#) to download an editable version of this planning guide.

	Lesson name	 Learning goals	 Preparation required?	 Ice breaker	 Core of the lesson	 To close	 Revision and mastery
Session 1	 Pre-test: Waves		Review teaching notes in Prepare Mode Collect Stile X books for this unit Find out more about using Stile X in The Stile Guide Send parent email template  10 minutes	Explain that you are starting a new unit about waves, and students will complete a pre-test to help you find out what they already know	Students complete a pre-test to show what they already know about waves	 Hand out Stile X booklets and activate Stile X app	Identify any familiar terms in the glossary section
Session 2	 1. Shining a light on communication	Explain a successful form of communication using a model	Review student answers to Pre-test: Waves in Analyse Mode to gauge students' prior knowledge Review teaching notes in Prepare Mode Print Morse code sheets Collect the required materials listed in the Lab Guide .  30 minutes	As a class, consider students' use of technology to communicate using a "five-finger" activity	Students work in groups to send a message across the room. First they do this without using devices or sound, then with no line of sight	Students create a model to describe the input, process and output of their communication method	 Stile X app: Flashcards  Glossary terms: encoding
Session 3	 Micro:bit Lesson 1: Light into sound  <i>This lesson is optional and can be skipped if you don't have access to micro:bit computers</i>	Write a program that can convert light pulses into sound	Provide feedback on the Key Question from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode Print Morse code sheets Collect the required materials listed in the Lab Guide .  30 minutes	As a class, read about the use of sound to send messages by Morse code	Students design, write and test code using micro:bit editor	Students play with morse receiver produced	 Stile X app: Flashcards
Session 4	 2. Modelling global communication	Model your current understanding of how a long-distance video call works	Provide feedback on the Key Question from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode Print individual model templates , group model templates and Driving Question Board title cards  25 minutes	Consider the 2022 volcanic eruption that left Tonga without access to communications technology	Students create and share models of how information flows around the world during a video call	Students use their group models to construct a Driving Questions Board	 Stile X app: Flashcards

Lesson Planning Guide

























The guide below is based on four 45-minute sessions per week.

	Lesson name	 Learning goals	 Preparation required?	 Ice breaker	 Core of the lesson	 To close	 Revision and mastery
Session 5	 3. Sound	Explain how sound is transmitted between two places	Provide feedback on the Key and Challenge Questions from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode Collect the required materials listed in the Lab Guide  25 minutes	As a class, watch a cymatics video. Complete a <i>See, Think, Wonder</i> thinking routine and discuss students' responses	Students complete a hands-on activity to investigate and explain the particle model of sound	Students use a model to explain how voices transfer energy and information	 Stile X app: Flashcards  Glossary terms: sound, transmission, medium
Session 6	 4. Wave properties	Explain how different sounds can be modelled using wave properties	Review teaching notes in Prepare Mode  10 minutes	As a class, watch a video to observe the wave patterns formed by sound travelling through a Rubens tube	Students investigate frequency and amplitude using a simulation. They describe different representations of sound waves	Students explain how a Rubens tube models the wave properties of different sounds Assign  Check-in #1 as home work to be completed before the next lesson.	 Watch Stile X app: Wave properties video  Complete Stile X Revision notes: Wave properties Glossary terms: density, amplitude, frequency, wavelength, wave, waveform
Session 7	 5. Reflection	Explain how the path of light determines which objects we can see	Review student results  Check-in #1 in Analyse Mode to determine if students are ready to move on or whether further teaching is required Provide feedback on the Key Question from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode  45 minutes	Students complete a live poll about how light allows us to see	Students distinguish between created and reflected light and investigate how light reflects off different objects	Students create a model to explain how cameras use reflected light to create images	 Watch Stile X app: Reflection video  Complete Stile X Revision notes: Reflection  Glossary terms: reflection, ray
Session 8	 6. Refraction	Explain how materials can be used to change the path of light	Provide feedback on the Key and Challenge Questions from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode Collect the required materials listed in the Lab Guide  30 minutes	Observe the multiple sensors on our mobile phones and recognise that those sensors are very small	Students use a hands-on activity and simulation to observe refraction and explain how a lens can change the size of an image	Students apply their understanding of refraction to explain how lenses change the size of images  Read the note-taking tip from page 9 of Stile X and briefly discuss the concept of summarising as a class	 Watch Stile X app: Refraction video  Complete Stile X Revision notes: Refraction  Glossary terms: lens, refraction

Lesson Planning Guide




























The guide below is based on four 45-minute sessions per week.

•..... Week 1 Week 2 **Week 3** Week 4 Week 5 Week 6▶

	Lesson name	 Learning goals	 Preparation required?	 Ice breaker	 Core of the lesson	 To close	 Revision and mastery
Session 9	 Updating our models		Provide feedback on the Key and Challenge Questions from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode  25 minutes	Students reflect on their models and discuss possible improvements	Students update their group models and upload a photo	Groups review their Driving Questions Board to mark off answered questions and add any new ones	 Stile X app: Flashcards
Session 10	 7. Brightness	Explain the result of the double-slit experiment using the wave model of light	Provide feedback on the Key Question from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode  25 minutes	As a class, make and discuss predictions about the results of the double-slit experiment	Students learn about different models of light used to explain light's properties	Students explain how interference between light waves produces the pattern observed in the double-slit experiment	 Watch Stile X app: Brightness video  Complete Stile X Revision notes: Brightness  Glossary terms: wave model, particle model, interference
Session 11	 8. Colour	Explain colour and brightness by applying the wave model of light	Provide feedback on the Key Question from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode  25 minutes	As a class, read a comic about Newton's discovery about light	Students use a simulation to explore the refraction of light through prisms	Students relate the wavelength and frequency of light waves to colour	 Watch Stile X app: Colour video  Complete Stile X Revision notes: Colour
Session 12	 9. How light interacts with objects	Model how light interacts with objects of different colours Explain how an object's material affects the way light interacts with it	Provide feedback on the Key Question from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode  25 minutes	As a class, watch a video of a laser interacting with different coloured gummy bears	Students explain how absorption and reflection of light makes objects appear different colours, and they use a simulation to investigate filters	Students apply their new understanding to explain the laser video Assign  Check-in #2 as homework to be completed before the next lesson.	 Watch Stile X app: How light interacts with objects video  Complete Stile X Revision notes: How light interacts with objects  Glossary terms: absorption, filter, photon




















Lesson Planning Guide

The guide below is based on four 45-minute sessions per week.

	Lesson name	 Learning goals	 Preparation required?	 Ice breaker	 Core of the lesson	 To close	 Revision and mastery
Session 13	 10. The electromagnetic spectrum	Explain why light waves can be transmitted through empty space	Review student results for  Check-in #2 in Analyse Mode to determine if students are ready to move on or whether further teaching is required Provide feedback on the Key and Challenge Questions from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode  45 minutes	Revisit the group models and Driving Questions Boards to identify relevant questions and ideas	Students explore different types of radiation in the electromagnetic spectrum	Students compare sound and light waves for use in long-distance communication  Read the expert study tip from page 19 of Stile X and talk about the benefits of writing practice questions as a class	 Watch Stile X app: The electromagnetic spectrum video  Complete Stile X Revision notes: The electromagnetic spectrum  Glossary terms: radiation, electromagnetic spectrum
Session 14	 11. Radio waves	Justify which type of wave is best for long-distance communication	Provide feedback on the Key Question from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode  25 minutes	As a class, recall and discuss different parts of the electromagnetic spectrum	Students examine the advantages of radio waves for communication	Students revisit and revise their group models	 Watch Stile X app: Radio waves video  Complete Stile X Revision notes: Radio waves
Session 15	 Micro:bit Lesson 2: Morse code via radio waves  <i>This lesson is optional and can be skipped if you don't have access to micro:bit computers</i>	Write a program for sending Morse code using radio waves	Provide feedback on the Key Question from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode Print Morse code sheets Collect the required materials listed in the Lab Guide  30 minutes	Introduce students to the task of upgrading their light-based communication method to use radio waves	Students design, write and test code using micro:bit editor	Students connect the activity back to the unit's guiding question	 Stile X app: Flashcards
Session 16	 12. Digital signals	Explain whether digital or analogue signals are more reliable for sending information	Provide feedback on the Key Question from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode  25 minutes	As a class, brainstorm and discuss the advantages and limitations of instant cameras and smartphone cameras	Students draw and compare models of analogue and digital signals	Students explain and evaluate choices between analogue and digital forms of communication Assign  Check-in #3 as home work to be completed before the next lesson.	 Watch Stile X app: Digital signals video  Complete Stile X Revision notes: Digital signals  Glossary terms: analogue information, digital information














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The guide below is based on four 45-minute sessions per week.

	Lesson name	 Learning goals	 Preparation required?	 Ice breaker	 Core of the lesson	 To close	 Revision and mastery
Session 17	 13. Satellite communication	Explain how digital signals are sent around the world using satellites	Review student results for  Check-in #3 in Analyse Mode to determine if students are ready to move on or whether further teaching is required Provide feedback on the Key Question from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode  45 minutes	As a class, consider possible explanations for Tonga's loss of communication technology following a volcanic eruption	Students compare types of satellite and consider their suitability for providing internet connection. They apply their knowledge to explain how satellite communication and digital signals connect video callers over long distances.	Students explore an interactive map of Starlink satellites and complete a thinking routine to interpret data and support a claim with evidence.	 Stile X app: Flashcards
Session 18	 14. Long-distance communication	Explain how digital signals are sent around the world via the internet	Review teaching notes in Prepare Mode  10 minutes	Students examine fibre-optic lamps and propose explanations for how light travels along curved fibres	Students explore the use of optical fibres in present-day long-distance communication and use models to compare satellite and fibre internet	Students apply their understanding to explain why Tonga lost some, but not all, of its communications with the rest of the world after a volcanic eruption	 Stile X app: Quiz
Session 19	 15. Re-modelling global communication	Explain, using a model, how a video call across the world works	Provide feedback on the Key and Challenge Questions from the previous lesson in Analyse Mode Review teaching notes in Prepare Mode Collect the required materials listed in the Lab Guide  40 minutes	Students work in groups to iterate on their models of global communication from earlier in the unit	Students revisit the questions on their Driving Questions Boards, resolve any questions they can answer and discuss any final comments or new questions	As a class, discuss students' reflections on the importance of telecommunication from a personal, social and global perspective	 Stile X app: Quiz
Session 20	 16. Bridging the digital divide	Create a model to communicate a problem and potential solutions	Review teaching notes in Prepare Mode  10 minutes	As a class, discuss the digital divide and brainstorm benefits of access to digital technology	Students research an aspect of the problem and propose a potential solution	Students create a social media post to communicate key discoveries	 Stile X app: Quiz

Lesson Planning Guide

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	Lesson name	 Learning goals	 Preparation required?	 Ice breaker	 Core of the lesson	 To close	 Revision and mastery
Session 21	Unit review		Review Key Questions from the unit in Analyse Mode to identify areas to revisit with students before the test  45 minutes	Students begin working on the  Stile X: Practice test	While students are working, select groups of students to revisit areas of difficulty	Encourage students to review feedback and model answers from the unit as well as  Stile X: Revision notes as revision	 Stile X: Glossary
Session 22	 Test: Waves			Seat students appropriately for the test	Supervise students as they complete the test	 Fast finishers can complete mindful colouring activities in Stile X	 Complete Stile X: Reflection



Call us on 1300 918 292



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Swing by the office to say hi!

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Stile HQ is located on the traditional lands of the Boon Wurrung and Woiwurrung (Wurundjeri) peoples of the Kulin Nation. We acknowledge that sovereignty was never ceded and pay our respects to Elders past, present and future.