



What is STEAM?

STEAM is an acronym that stands for Science, Technology, Engineering, Arts and Maths. It is based on Inquiry-Based Learning, the Communicative Approach and CLIL. STEAM encourages experiential and holistic learning and it focuses on 21st-century skills. STEAM-based learning allows for learner-centred and student-led lessons where the teacher has the role of an explorer among the learners.

What are the aims of STEAM in the English classroom?

The use of STEAM in the English classroom aims to:

- encourage the exploration of the world, and help students gain knowledge about real-life situations.
- reinforce independence and autonomy, and make learners responsible for their own learning process.
- develop communication skills by using the English language, and support interaction skills between learners.
- engage and motivate students in their own learning process.

What are the benefits of STEAM in the English classroom?

- Learners gain knowledge about the world around them.
- They collaborate with their peers in order to complete the STEAM challenges.
- They use the English language as the medium of communication and they accomplish their tasks by gaining new learning outcomes.
- They develop important 21st-century skills (Communication, Collaboration, Creativity, Critical Thinking and Problem-Solving).
- They become curious, and they are eager to learn more and continue their learning process.
- They are actively engaged in the learning process.
- They feel secure throughout the learning process and they are able to develop and share ideas with their peers.
- They become autonomous and independent, an extremely important asset for the language-learning process.

Science

Science is commonly used to learn about and explain the natural world through experiments, but it is not only about that. It provides students with a different way of thinking and allows them to predict, observe and draw conclusions from their findings. By encouraging students to ask questions, solve problems and explain ideas, they develop scientific inquiry. Young learners are very interested in experimenting, testing and trying new things so through science, they become more motivated and eager to learn.

Technology

Technology is not only used to develop software and apps or to design electronic devices. It refers to a wide range of tools that have got a practical application. In the English language classroom, we use technology to help young learners understand the order and the process behind designing or building something that works.

Engineering

Engineering is a part of STEAM that combines elements of Arts and Maths. It is not only about creating crafts though. Students build projects by calculating, using various materials or searching for appropriate materials. This way, they dive into the process of creating specific mechanisms or equipment. Then, students have to test their designs and reflect on ways to improve them.

Arts

Arts is the most creative part of STEAM and the reason why STEM has been transformed into STEAM. The Arts section reinforces engagement and inspiration, and it promotes chances for innovation in the classroom. Arts includes drawing and painting, but it could also include drama, poetry, theatre, photography, videography, dancing and music. When children have the chance to produce art, they are able to express themselves, think creatively and use their imagination. The process starts with the inspiration stage where students observe and study pieces of art. Then, they create a draft of their pieces of art, which is a great way for students to understand the importance of drafting and redrafting – a useful technique for their future steps in STEAM and learning in general.

Maths

Maths is usually combined with Science and/or Engineering, and plays an important role in developing students' way of thinking by helping them develop their problem-solving and critical-thinking skills. Maths is implemented as a learning process during which students calculate, investigate graphics or experiment with concepts of geometry.



THE REAL STEAM A1

INTRODUCTION TO THE TEACHER

The Steps

A iWonder: During this initial stage, students answer simple questions to raise their interest in the STEAM activity and activate any previous empirical or academic knowledge of the topic.

B iImagine: In the second stage, learners predict or imagine what is going to happen. This stage promotes students' critical thinking and creativity, and motivates them for what follows.

C iExplore: In this stage, students follow the steps to carry out their experiment or create something. While the teacher is always there to monitor the activity and provide help, it is important for students to do their project/experiment by themselves or in pairs/groups. This way, students develop their critical thinking, collaboration and communication skills.

D iObserve: The observation stage is very important since students have to think critically and understand what they have explored. Students collaborate, discuss and share their thoughts on what they see/observe.

E iCreate: During the creative stage, students present the results of their project/experiment and their observations in the form of a drawing, poster, table, chart, presentation, etc. This allows students to gain a deeper understanding of the STEAM activity and also to improve their presentation skills as well as their overall self-confidence.

F iEvaluate: In this step, learners reflect on the process of the STEAM activity and the knowledge they gained from it, and identify strengths and weaknesses.

The Role of the Teacher

Teachers do not need to be STEAM experts or researchers to teach English through STEAM, as this is an approach to language learning in which students and teachers work together. Teachers need to be enthusiastic and excited for what is coming and eager to learn more about the STEAM mindset. It is a process that allows teachers to encourage curiosity and inquiry. Teachers monitor the activities and give feedback to students when necessary. They also motivate students to complete their STEAM challenge and encourage them to develop their social and thinking skills, thus developing their self-esteem.

STEAM Corner

It is a good idea to create a STEAM corner at the beginning of the school year. This is a corner of the classroom where students can find their tools and their materials, and display their creations. Teachers will also be able to use students' creations for future lessons or even as props for higher/lower levels. A STEAM corner will also encourage students' curiosity and organisational skills, since they will be able to find everything that is needed for their challenges there.

Some Tips

- Organise the materials before each lesson so as to have everything ready for the next STEAM activity.
- Set time limits during the stages of the challenges in order for students to carry them out more easily and effectively.
- If a STEAM activity doesn't work, there is no need to feel stressed. What matters most is the process, not necessarily the end result. Find alternative ways to explain the conclusion to your students, and explore together what went wrong and what should be done differently next time.
- Give feedback to students when necessary and provide them with help whenever they need it.
- Follow the instructions about pair work/groupwork to ensure communication between students.



Science 1 – What is a Chemical Reaction?

Materials:

For this experiment, you will need:

- gummy worms
- vinegar
- baking soda
- some warm water
- 2 jars
- a pair of tongs

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 2:** A, B, C, D and F are chemical reactions.)
- Show the materials in the *Imagine* section to the Ss and elicit how they can use them for the experiment. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw or write their ideas for a chemical reaction using the materials given in the box. Alternatively, they can draw or write in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the experiment in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to do the experiment. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss work with their partner to draw the experiment they performed. Explain that they need to make a detailed diagram to show what happens in each stage of the experiment.
- Then, invite some pairs to present the experiment to the class.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, ask Ss to measure the length of the gummy worms before and after the experiment, and guess why this happens.

Science 2 – Can we Measure Wind Speed?

Materials:

For this project, you will need:

- a drawing pin
- 2 straws
- a hole puncher
- a pencil with a rubber on top
- 5 paper cups
- scissors
- some sticky tape
- an empty plastic container with a cap (e.g. an empty water bottle)
- some heavy objects (e.g. pebbles)
- a stopwatch

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 3:** surfing, sailing, flying a kite)
- Show the materials in the *Imagine* section to the Ss and elicit how they can use them for their model. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw an anemometer in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this. Elicit Ss' ideas about where we can see wind turbines (e.g. at the top of the hill or mountain or near the sea where the winds are stronger).
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the model of an anemometer. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss use the anemometer they built to study the wind during a weekend and write down their findings.
- In the next lesson, invite some students to present the findings to the class.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.

Science 3 – The Solar System

Materials:

For this project, you will need:

- 9 Styrofoam™ balls of various sizes
- a Styrofoam™ ring (about 7 cm across)
- wooden skewers
- paints and paintbrushes
- scissors

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 3:** Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune)
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to make a model of the Solar System. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a model of the Solar System in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the model of the Solar System. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss work in groups to research online, collect information about the planets and the Sun and prepare posters about them.
- Invite some students to present their posters to the class. Alternatively, you can allow Ss time to work on this at home and present their posters in the next lesson.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, ask Ss to use their imagination and come up with their own phrase to remember the names of the planets and their order from the Sun.

Science 4 – Soil Layers

Materials:

For this experiment, you will need:

- soil
- sand
- some water
- small rocks (from a garden or the local park)
- blue food colouring
- grass (from a garden or the local park)
- a big jar
- clay
- cotton wool

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 4:** 1D, 2E, 3A, 4C, 5B)
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to make a model of soil layers. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a model of soil layers in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the experiment in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the model of soil layers. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss can work individually, in pairs or in groups to research online and collect more information about soil layers.
- Invite some students to give a presentation about soil layers to the class. Alternatively, you can allow Ss time to work on this at home and give their presentations in the next lesson.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.



Science 5 – Colours! Colours!

Materials:

For this experiment, you will need:

- surgical spirit
- 7 pieces of white chalk
- 7 small glass or plastic bowls
- 7 washable markers

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 2a:** orange, purple and green / **Key to Ex. 3:** black)
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to make a chromatography experiment. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the experiment in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the experiment. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss draw the steps of the experiment and then present their drawings to the class.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, Ss repeat the chromatography experiment using a pink and a brown marker and record their findings. (**Key:** pink separates into red and white; brown separates into red, yellow and blue).

Technology 1 – A Simple Microscope

Materials:

For this project, you will need:

- a plastic cup
- plastic wrap
- a rubber band
- scissors
- some water
- tweezers

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to make a simple microscope. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a model of their microscope in the box. Alternatively, they can draw in their notebooks.
- Elicit Ss' ideas about what they can study under a microscope and allow them time to collect a few items.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss create two drawings of the item they studied: one to show what they can see without the help of a microscope and another to show what they can see with the help of the microscope.
- Invite several Ss to present their drawings to the class and then display their drawings on the classroom walls.
- After finishing all the steps, Ss complete the sentence that is true about them in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.

Technology 2 – An Amazing Maze

Materials:

For this project, you will need:

- a big ball of clay
- a baking tray
- a rolling pin
- a plastic knife
- a bowl of water
- a marble

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Show the materials in the *iImagine* section to the Ss and elicit how they can use them to make a maze. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to brainstorm for ideas and draw their maze in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss swap their mazes and put them to the test. They try to get their marble from Start to Finish and they record the time it takes.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, Ss can work in pairs or groups to research online and collect information about the Labyrinth, the famous maze in Greek mythology, and give a presentation to the class.

Technology 3 – Let's Go Camping

Materials:

For these projects, you will need:

- various wooden sticks
- 2 toilet roll tubes
- some pieces of cardboard
- a ruler
- glue
- a hole puncher
- some string
- scissors
- coloured paper or coloured markers

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meaning of the word.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Show the materials in the *iImagine* section to the Ss and elicit how they can use them to make a model of a tent and a model of binoculars. Give Ss some time to work together and answer the questions. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a model of a tent and a model of binoculars in the boxes provided. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* boxes. Elicit if Ss knew these facts.
- Organise Ss into 2 groups. Each group will work on one of the projects: **Group A** will create the tent and **Group B** will create the binoculars.
- A student from each group reads the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the projects. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss from group A decide where to put their tents up in the map provided and explain why they chose these places (e.g. they are near water). Ss from group B give a short presentation about their binoculars including the information requested.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.



Technology 4 – Telephones – Past & Present

Materials:

For this project, you will need:

- 2 paper cups
- a piece of string (about 2 m long)
- scissors

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 3:** A4, B1, C5, D3, E2)
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to make a model of a simple telephone. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a model of a simple telephone in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, test their telephones and then talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss play a game to test their telephones.
- Then, ask Ss to write a short text to present their telephones to the class. Invite some Ss to read their texts to the class. Alternatively, Ss can work on this at home and read their texts in the next lesson.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, Ss can work in pairs or groups to research online and collect information about Alexander Graham Bell and the telephone he invented, and then prepare a poster. Invite some Ss to present their posters to the class.

Technology 5 – Listen to your Heart

Materials:

For this project, you will need:

- the tube from a roll of paper towel
- some duct tape
- 2 plastic funnels (a big one and a small one)
- a stopwatch

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to make a model of a stethoscope. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a model of a stethoscope in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, test their stethoscopes and then, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss record a short video (they can do this with a camera or a smartphone) to present their stethoscopes and explain why doctors need them to examine their patients and why young children should not be afraid of doctors.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, Ss can test their stethoscopes again on their family members and compare their heartbeats.

Engineering 1 – My Dream School

Materials:

For this project, you will need:

- a large piece of cardboard (1 m x 1 m or 1 m x 1.5 m)
- Plasticine™ or any other modelling material (various colours)
- glue
- scissors
- coloured paper
- paints & paintbrushes
- various toys (e.g. Playmobil®)
- some shoeboxes without lids

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 3:** 1C, 2B, 3D, 4A)
- Allow Ss time to research online and find photos of unusual or extraordinary schools from around the world. These photos can inspire Ss to create their own dream schools.
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to make a model of their dream school. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a model of their dream school in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this. Elicit Ss' answers about whether they do the same in their school/country.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, invite several Ss to present their dream schools to the class.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.

Engineering 2 – The Earth's Orbit

Materials:

For this project, you will need:

- 2 Styrofoam™ balls (a big one and a small one)
- a paper cup
- wooden skewers
- a hole puncher
- a piece of cardboard
- paper straws
- scissors
- glue
- paints & paintbrushes

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to make a model of the Earth's orbit around the Sun. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a model of the Earth's orbit around the Sun in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, test their models and then talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss make a drawing to show how the Earth orbits the Sun.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, Ss can try an experiment to understand how the Earth spins around itself. Elicit Ss's ideas about when it is day and when it is night.



Engineering 3 – Enjoy the Ride!

Materials:

For this project, you will need:

- 6 toilet roll tubes
- a large piece of cardboard
- wooden sticks
- clear sticky tape
- paints & paintbrushes
- a marble
- glue
- scissors

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Allow extra time for Ss to research online and collect information about the largest amusement parks in the world and find photos of these parks.
- Show the materials in the *iImagine* section to the Ss and elicit how they can use them to make a model of a roller coaster. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a roller coaster in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, test their models and then talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss organise a marble race in teams and record the time it takes for the marble of each team to roll down the roller coaster.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.

Engineering 4 – Let's Play!

Materials:

For this project, you will need:

- a large piece of cardboard
- glue
- scissors
- an A4 piece of paper
- coloured paper
- Plasticine™ or any other modelling material
- coloured markers

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- In the *iImagine* section, allow Ss enough time to brainstorm for ideas before they start designing their own board games.
- Then, show the materials to the Ss and elicit how they can use them to make their own board games. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw their board games in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- In the *iExplore* section, Ss work in groups. Each group creates its own board game. A student in each group reads the steps of the project. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs and then talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, each group writes the rules of the game on a piece of paper. Then, the groups exchange board games and play the games.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section to give their feedback and comments to the other groups.
- Then, Ss complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.

Engineering 5 – Zip lines

Materials:

For this project, you will need:

- rope or string
- scissors
- sticky tape
- a stopwatch
- a paper cup
- a paper straw
- some marbles

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Show the materials in the *iImagine* section to the Ss and elicit how they can use them to make a zip line. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a sketch of their zip lines in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, test their zip lines and complete the tables in the *iObserve* section. Then Ss talk about and write down their observations.
- In the *iCreate* section, Ss give presentations about zip lines. Alternatively, you can allow Ss time to do some extra research at home and give their presentations in the next lesson.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, you can allow Ss time to organise a zip line race in groups.

Arts 1 – A Collage Tells a Story

Materials:

For this project, you will need:

- photos you can find in newspapers, magazines or online
- a large piece of cardboard
- scissors (if you want)
- coloured pens
- glue

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (Key to Ex. 3: the first and the third are collages)
- Show the materials in the *iImagine* section to the Ss and elicit how they can use them to make a collage. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to brainstorm for ideas and think about what other materials they could use for their collage and how they can create it.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss present their collages to the class and tell a story (if there is one behind it). Alternatively, you can allow Ss time to work on this at home and present their collages in the next lesson.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.

Arts 2 – An Upcycled Vase

Materials:

For this project, you will need:

- a plastic bottle or a detergent container or a milk carton or a jar or a tin can or a glass bottle
- some string
- paints and paintbrushes
- scissors
- glue
- coloured markers

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (Key to Ex. 2: 1, 2, 3, 4 and 6 are examples of upcycling)
- Show the materials in the *imagine* section to the Ss and elicit which of them they can use to make an upcycled vase. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a sketch of their vase in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, compare the vases they've created, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss present their upcycled vases to the class, including the points given.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, Ss can organise an art exhibition at school to celebrate Earth Day and present the vases they created from rubbish.

Arts 3 – Animal Talk

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (Key to Ex. 4: 1B, 2D, 3E, 4C, 5A) You can ask Ss to repeat the names of the animals and the sounds they make to practise the new vocabulary.
- Show the photos of animals in the *imagine* section to the Ss and elicit what they are trying to communicate. Then, give Ss some time to work together and answer the question. Monitor the pairs as they are working together. (Key: 1D, 2A, 3F, 4B, 5C, 6E)
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the game in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to play the game. Help and support if necessary.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, allow Ss time to research online and find videos of animals communicating in different ways. Then, invite some Ss to show their videos to the class and explain how animals communicate. Alternatively, you can allow Ss time to do some extra research at home and give their presentations in the next lesson.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, ask Ss to research online, collect information about another way animals use to communicate and present it to the class.

Arts 4 – Be a Poet

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Show the types of poems in the *imagine* section to the Ss and elicit whether Ss know what types of poems these are. Then, give Ss some time to work together, read the descriptions of poems and then try to match each poem to its description. Monitor the pairs as they are working together. (Key: 1C, 2A, 3B). Elicit from Ss which parts of the descriptions helped them decide.
- Explain what metaphors and similes are. Give some examples in Ss' L1. Then allow Ss time to work together and decide what each sentence in Ex. 6a is. (Key: 1M, 2S, 3M, 4S, 5S, 6M).
- Allow some time for Ss to go through the poems again and identify an example of a metaphor (Poem 3: *the fog comes on little cat feet*) and a simile (Poem 1: *the snow is like a blanket*).
- Allow Ss time to research online and find a poem they like and write it in the box provided. Alternatively, Ss can write the poem in their notebooks. They can draw a picture to show what the poem is about if they like.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps for writing a poem in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to use their imagination and write a poem. Help and support if necessary.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, invite Ss to read their poems aloud in class. Explain that they can use their voices to express different emotions.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, ask Ss to research online, collect information about William Shakespeare and his poems, and present it to the class.

Arts 5 – Shadow Theatre

Materials:

For this project, you will need:

- a large cardboard box
- scissors
- some pieces of black cardboard
- a piece of thin white paper
- wooden skewers
- a torch
- paints and paintbrushes
- sticky tape

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (Key to Ex. 4: 1 musical, 2 opera, 3 puppet theatre, 4 shadow theatre, 5 street theatre, 6 pantomime) You can ask Ss to repeat the names of the types of theatre to practise the new vocabulary.
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to create a shadow theatre and shadow puppets. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to think of and draw a sketch of a shadow puppet in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts. Also, elicit Ss' answers about whether shadow theatre is popular in their own countries.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to create their shadow theatre and shadow puppets. Help and support if necessary.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, allow Ss time to prepare and put on a shadow theatre play using all the shadow puppets they have created.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, allow Ss time to practise making various shadows using their hands.



Maths 1 – 3D Shapes

Materials:

For this project, you will need:

- toothpicks
- jelly beans

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 2:** 1 cylinder, 2 cube, 3 cone, 4 sphere, 5 square pyramid) You can ask Ss to repeat the names of the types of the 3D shapes to practise the new vocabulary.
- Explain that 3D shapes have got faces, edges and vertices. Allow Ss time to study the shapes, identify their characteristics and then do the task in Ex. 4b. (**Key:** 1 cube: 6 faces, 12 edges and 8 vertices, 2 sphere: 1 face, 0 edges and 0 vertices, 3 square pyramid: 5 faces, 8 edges and 5 vertices)
- Show the materials in the *iImagine* section to the Ss and elicit how they can use them to build models of 3D shapes. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw a sketch of a 3D shape in the box provided. Alternatively, they can draw in their notebooks.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to create their 3D shapes. Help and support if necessary.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, allow Ss time to create the biggest 3D shape they can with toothpicks and jelly beans. Then, Ss describe their 3D shapes to the class.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.
- As an extension, allow Ss time to research online and find examples of 3D shapes from real life, prepare a poster and present it to the class. (e.g. the Earth looks like a sphere, a tent looks like a square pyramid, a dice looks like a cube, a carrot looks like a cone, a can of cola looks like a cylinder)

Maths 2 – The Symmetry of the Human Body

Materials:

For this project, you will need:

- a large roll of paper (long and wide enough to fit a student)
- scissors
- a marker
- a ruler
- sticky tape

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Show the materials in the *iImagine* section to the Ss and elicit how they can use them to see whether the human body has got symmetry. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support if necessary.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, allow Ss time to measure the different parts on the right and the left side of the body. Then, Ss share their findings with the class.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.

Maths 3 – Calculations

Procedure:

- Go through the new vocabulary and explain/elicite the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 1:** 1 time or speed or distance, 2 distance, 3 height)
- Go through the 4 operations of maths in the *Imagine* section with the Ss and elicit what their names are in Ss' L1. Present the names of the 4 operations in English and ask Ss to repeat them chorally and individually. Then, elicit examples of addition, subtraction, multiplication and division from various Ss around the class.
- Explain to Ss that in order to calculate time, distance and length, it is important to read the questions carefully and think which operation they need to do: addition, subtraction, multiplication or division.
- Go through the table and explain to the Ss how we calculate time. Allow Ss some time to practise with seconds, minutes, hours, etc.
- Then, in pairs, Ss go through the 4 questions in the *iExplore* section – *Calculating Time*. Help and support when necessary. Ss can write in their notebooks if they want.

Calculating Time Key:

- 1 $60 \times 7 = 420$ seconds
 - 2 $4:50 - 4:15 = 35$ minutes
 - 3 $25 + 25 = 50$ minutes per week
 50×4 weeks = 200 minutes (in a month)
 - 4 $5 \times 60 = 300$ minutes
 $300 + 15 = 315$ minutes in total
 $315 \div 7 = 45$ minutes each day
- Go through the table and explain to the Ss how we calculate distance. Allow Ss some time to practise with centimetres, metres, kilometres, etc.
 - Then, in pairs, Ss go through the 4 questions in the *iExplore* section – *Calculating Distance*. Help and support when necessary. Ss can write in their notebooks if they want.

Calculating Distance Key:

- 1 $344 \times 1,000 = 344,000$ metres
 - 2 $4 + 6 + 5 = 15$ kilometres
 - 3 $5,000 - 2,850 = 2,150$ metres
 - 4 $75 \div 5 = 15$ kilometres
- Explain to the Ss that we use centimetres, metres, kilometres, etc to calculate length as well.

- Then, in pairs, Ss go through the 4 questions in the *iExplore* section – *Calculating Length*. Help and support when necessary. Ss can write in their notebooks if they want.

Calculating Length Key:

- 1 $4 + 4 + 4 + 4 = 16$ centimetres (addition)
 - 2 $4 \times 4 = 16$ centimetres (multiplication)
 - 3 The pen is 9 cm long.
The pencil is 7 cm long.
The pen is 2 cm longer than the pencil.
 - 4 $48 \div 8 = 6$ metres
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
 - In the *iCreate* section, allow Ss time to work in pairs. They choose one of the categories and design four problems: one that uses addition, one that uses subtraction, one that uses multiplication and one that uses division. Ss give the problems they designed to their partner to solve.
 - After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
 - Encourage a class conversation about the STEAM activity.



Maths 4 – Stick to the Budget

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Allow Ss time to go through the questions in the *imagine* section and write their ideas. Allow extra time for Ss to check online and find the prices of the various products in Ex. 4. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the budget planner project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the budget planner. Help and support if necessary.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss present their budget planners to the class and explain why they decided to spend their money in this way.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.

Maths 5 – The School Canteen

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Allow Ss time to go through the price list in the *imagine* section. Explain the difference between retail price and wholesale price. Give the L1 alternatives if necessary.
- Allow Ss more time to discuss the prices in the price list. Explain that in the UK, people use pounds (£) to buy things. There are 100 pence (p) to the pound (£). Monitor the pairs as they are working together.
- You can ask Ss to repeat the snacks, drinks and prices in the price list to practise the new vocabulary.
- Ask a student to read the steps in the *iExplore* section to help Ss create a price list for the school canteen. Explain/Provide further information if necessary.
- Allow Ss time to complete the price list. Help and support if necessary.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss can work individually, in pairs or in groups. They design a price list for the school canteen and decorate it in any way they like. Invite several Ss/pairs/groups to present their price lists to the class. Alternatively, Ss can work on this at home and present their price lists in the next lesson.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section and complete the Evaluation Form at the back of their books.
- Encourage a class conversation about the STEAM activity.

Project 1 – Mother Nature

Aim

Nature offers us the food we eat and the water we drink. That's why we also call it Mother Nature. The aim of this project is to understand the important role of nature. In this project, we learn about:

- plants
- the water cycle
- what plants need to grow
- how important it is to collect rainwater
- the food pyramid

Suggested timeline

Week 1: We explore the different parts of plants.

Week 2: We learn about the water cycle.

Week 3: We learn about what plants need to grow.

Week 4: We learn about the importance of collecting rainwater.

Week 5: We learn about the food pyramid and its importance.

TIPS:

- Before you start this long-term project, you can write the timeline on a piece of A4 paper and post it on the classroom wall. You can ask students to brainstorm on the titles of every week and think about what they'll do every week. This way, you can engage your students and make them feel curious and motivated about the project.
- The weekly timeline above is a suggestion only. Teachers can either complete all the tasks in one lesson, or divide them into smaller parts and complete them in more than one lesson.

Week 1: Plants

Materials:

For this project, you will need:

- a big piece of cardboard
- Plasticine™ or any other modelling material (various colours)
- a wooden knife

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the question in the *iWonder* section and draw any of the plants they know. Alternatively, Ss can draw in their notebooks.
- Allow Ss time to read the descriptions of the different parts of a plant. Explain further if necessary. Then, ask Ss to label the parts of the plant. (**Key:** 1 flower, 2 leaves, 3 stem, 4 roots)
- Show the materials in the *Imagine* section to the Ss and elicit how they can use them to create a model of a plant. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to draw their ideas in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to do the project. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss present their projects to the class, point out the different parts of a plant and explain what each part does.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section.
- Encourage a class conversation about the STEAM activity.
- As an extension, ask Ss to take pictures of various plants they might see next time they go out in nature, research the names of the plants and present them to the class.



Week 2: The Water Cycle

Materials:

For this experiment, you will need:

- a plastic seal bag
- water
- a permanent marker
- sticky tape
- blue food colouring (optional)

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Allow Ss time to read the descriptions of the four parts of the water cycle. Explain further if necessary. Then, ask Ss to label the parts of the water cycle. (**Key:** 1 evaporation, 2 condensation, 3 precipitation, 4 collection)
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to make an experiment to show the water cycle. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the experiment in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to do the experiment. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss create a poster to show how the water cycle works. Invite several Ss to present their posters to the class.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section.
- Encourage a class conversation about the STEAM activity.

Week 3: What plants need to grow

Materials:

For these experiments, you will need:

- various seeds (peas, cress or lentils)
- cotton wool
- some empty jars
- a spray bottle with water

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key:** rice and lotus need a lot of water to grow, cactus and aloe don't need a lot of water to grow)
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to grow plants in class. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Organise the Ss into two groups. Each group will try a different experiment. Group A will try an experiment to see how much water plants need to grow. Group B will try an experiment to see how much sunlight plants need to grow.
- Ask two Ss (one from each group) to read each of the *Did You Know?* boxes. Elicit if Ss knew these facts.
- Ask a student from each group to read the steps of each experiment in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the experiments. Help and support throughout the process. Elicit Ss' ideas about what they think will happen.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, invite both groups to prepare a short video to explain how plants grow. In their videos, each group explains the importance of water and sunlight for plants. To create a video, Ss will need a camera or a smartphone. Explain to the Ss that they can take photos or very short videos (about 30" long) of their plants every day to show how much they grow (or not grow). Then, they can edit their videos with the help of an app. An app can make the video go faster or slower, add music or other sounds. They can also include words on the screen.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section.
- Encourage a class conversation about the STEAM activity.

Week 4: A Useful Gardening Tool

Materials:

For this project, you will need:

- a big empty water bottle
- scissors

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Show the materials in the *iImagine* section to the Ss and elicit how they can use them to create a tool to water plants. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then, allow some more time for Ss to brainstorm for ideas and draw their ideas in the box. Alternatively, they can draw in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to complete the project. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss test their tools to see if and how they work. Then, Ss present their tools to the class, explaining how they created them and how these tools help the environment.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section.
- Encourage a class conversation about the STEAM activity.

Week 5: The Food Pyramid

Materials:

For this project, you will need:

- pictures of food (Ss can find them online, from magazines, or they can draw them)
- 3 pieces of cardboard
- scissors
- sticky tape
- glue
- a ruler

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Allow Ss time to read the names of the different food groups in the *iImagine* section. Explain further if necessary. Then ask Ss to match the food groups with the different foods and answer the questions. (**Key:** 1C, 2A, 3D, 4E, 5B/1F, 2T, 3 peppers, tomatoes, strawberries, etc)
- Allow Ss time to think about how a food pyramid shows what we need to eat and how much. Ss can write their ideas in the pyramid in their books, or they can draw a pyramid in their notebooks and include their ideas there.
- Show the materials in the *iImagine* section to the Ss and elicit how they can use them to create a food pyramid. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to do the project. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss research online and collect information about each food group and why it's important for our health. Then invite several Ss to give a presentation about the food pyramid and the importance of each food group. You can allow Ss to work on this section at home and give their presentations in the next lesson.
- After finishing all the steps, Ss complete the sentences in the *iEvaluate* section.
- Encourage a class conversation about the STEAM activity.
- Allow some classroom time to go through the questions in the *iExtend* section and have a class discussion to evaluate this long-term project.

Project 2 – Look Up!**Aim**

The aim of the project is to help us learn more about the Moon, the Earth's only natural satellite. In this project, we learn about:

- the Moon and the lunar eclipse
- the phases of the Moon
- the first step on the Moon
- the surface of the Moon
- how astronauts can work on the Moon

Suggested timeline

Week 1: We learn some facts about the Moon and lunar eclipses.

Week 2: We learn about the phases of the Moon.

Week 3: We learn about the first man on the Moon and how they got there.

Week 4: We explore the surface of the Moon.

Week 5: We learn about NASA's Artemis project and how astronauts can work on the Moon.

TIPS:

- Before you start this long-term project, you can write the timeline on a piece of A4 paper and post it on the classroom wall. You can ask students to brainstorm on the titles of every week and think about what they'll do every week. This way, you can engage your students and make them feel curious and motivated about the project.
- The weekly timeline above is a suggestion only. Teachers can either complete all the tasks in one lesson, or divide them into smaller parts and complete them in more than one lesson.

Week 1: The Moon**Materials:**

For this project, you will need:

- a torch
- paints and paintbrushes
- 2 Styrofoam™ balls (a small one and a larger one)
- two wooden skewers

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 3:** the Moon's diameter is 3,475 km. According to NASA, the Moon is less than a third the width of the Earth.)
- Allow Ss time to guess which planet is the biggest and which is the smallest in Ex. 4 in the *imagine* section. Ss can check their answers online. (**Key:** 1: the Moon, 2: the Earth, 3: the Sun)
- Then, allow Ss more time to work on Exs 5 and 6 of the *imagine* section so they are introduced to the idea of lunar eclipses. Explain further if necessary.
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to make a model of a lunar eclipse. Give Ss time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to do the project. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss research online and find a video of a lunar eclipse. Invite several Ss to show the videos they found to the class and explain how a lunar eclipse takes place. You can allow Ss to work on this section at home and give their presentations in the next lesson.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section.
- Encourage a class conversation about the STEAM activity.
- As an extension, Ss can research online and collect information about solar eclipses. Invite several Ss to present their findings to the class.

Week 2: The Phases of the Moon

Materials:

For this project, you will need:

- a pencil
- a big Styrofoam™ ball
- a camera or a smartphone
- a torch
- a piece of tinfoil

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. Allow some more time for them to draw the different shapes of the Moon. Ss can draw in their notebooks if they like.
- Show the materials in the *Imagine* section to the Ss and elicit how they can use them to see the phases of the Moon. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to do the project. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss prepare a poster to show the different phases of the Moon. Encourage Ss to use their creativity to prepare their posters. Invite several Ss to present their posters to the class. You can allow Ss to work on this section at home and present their posters in the next lesson.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section.
- Encourage a class conversation about the STEAM activity.

Week 3: The First Step on the Moon

Materials:

For this experiment, you will need:

- an empty 1-litre water bottle
- a piece of paper towel
- a cork (that fits the neck of the bottle)
- duct tape
- three paper straws
- baking soda
- some vinegar
- a piece of cardboard
- safety goggles
- glue

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Allow Ss time to research online and find photos of the first person on the Moon. Alternatively, Ss can draw the first person on the Moon. Ss can draw in their notebooks if they want.
- Show the materials in the *Imagine* section to the Ss and elicit how they can use them to build a rocket and understand how the first people travelled to the Moon. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Ask a student to read the *Did You Know?* boxes. Elicit if Ss knew these facts.
- Ask a student to read the steps of the experiment in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to carry out the experiment. Help and support throughout the process. For safety reasons, this experiment should be carried out in an open space and it is strongly advised that Ss taking part wear safety goggles.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss research online and collect information about the rockets that went to the Moon. They can also find videos showing rockets launch. Invite several Ss to present their findings to the class and explain how rockets launch. Ss can work on this section at home and give their presentations in the next lesson.
- After finishing all the steps, Ss answer the question in the *iEvaluate* section.
- Encourage a class conversation about the STEAM activity.
- Allow some time to have a class discussion about the famous phrase Neil Armstrong said when he landed on the Moon. Encourage all Ss to share their ideas and opinions.



Week 4: The Surface of the Moon

Materials:

For this experiment, you will need:

- a newspaper you don't need anymore
- a baking tray
- flour (about 1 kg)
- cocoa powder (about 250 gr)
- a sifter
- small pebbles (of different sizes)

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section. (**Key to Ex. 1:** rock and metal)
- Allow Ss time to read the descriptions of the different parts of the Moon and label them on the picture of the Moon. (**Key:** 1 sea, 2 mountain, 3 crater)
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to understand what the surface of the Moon looks like and how craters form on the surface of the Moon. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew these facts.
- Ask a student to read the steps of the experiment in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to carry out the experiment. Help and support throughout the process.
- Allow Ss time to work in pairs, talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss research online, collect information about the NASA Apollo landings on the Moon and prepare a poster to show these landings. Then, invite several Ss to present their posters to the class and explain why astronauts decided to land in these places. Ss can work on this section at home and present their posters in the next lesson.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section.
- Encourage a class conversation about the STEAM activity.

Week 5: Astronauts Work on the Moon

Materials:

For this project, you will need:

- a reusable metal straw
- a ruler
- a round pencil
- 2 round hard sweets with a hole
- scissors
- some pieces of corrugated cardboard
- sticky tape
- 2 rubber bands

Procedure:

- Explain the aim of the lesson to the Ss.
- Go through the new vocabulary and explain/ elicit the meanings of the words.
- Organise Ss into pairs and allow them time to think about and answer the questions in the *iWonder* section.
- Allow Ss time to read the information about NASA's Artemis project and study the diagram that shows how astronauts will travel to the Moon and stay there to study it. Explain further if necessary. You can also show a video to the Ss from an online source (e.g. How We Are Going to the Moon (NASA) https://www.youtube.com/watch?v=_T8cn2J13-4).
- Then ask Ss to answer the questions in pairs. (**Key:** 1 The Space Launch System, 2 carry the astronauts to the Moon, 3 on the Gateway, 4 they will use rovers)
- Show the materials in the *imagine* section to the Ss and elicit how they can use them to create a lunar rover. Give Ss some time to work together and answer the question. Monitor the pairs as they are working together.
- You can ask Ss to repeat the materials to practise the new vocabulary.
- Then allow Ss more time to draw a model of their rovers in the box given. Alternatively, then can draw their models in their notebooks.
- Ask a student to read the *Did You Know?* box. Elicit if Ss knew this.
- Ask a student to read the steps of the project in the *iExplore* section. Explain/Provide further information if necessary.
- Allow Ss time to do the project. Help and support throughout the process.
- Allow Ss time to work in pairs, test their models and then talk about and write down their observations in the *iObserve* section.
- In the *iCreate* section, Ss present their lunar rovers and explain how they built them.
- After finishing all the steps, Ss answer the questions in the *iEvaluate* section.
- Encourage a class conversation about the STEAM activity.
- Allow some classroom time to go through the questions in the *iExtend* section and have a class discussion to evaluate this long-term project.