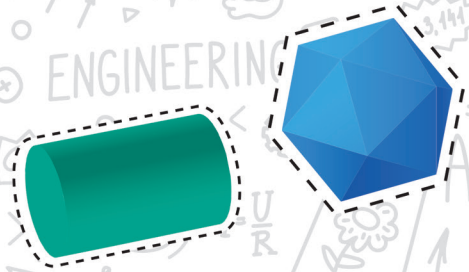
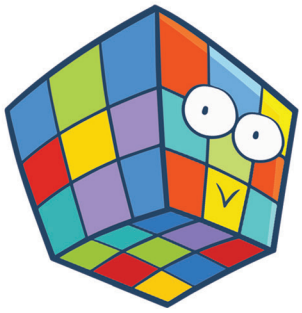
The REAL STEAM



Konnie Karma

Pre A1

Express Publishing



The REAL STEAM

Konnie Karma

Pre A1

Express Publishing

Published by Express Publishing

Liberty House, Greenham Business Park, Newbury,
Berkshire RG19 6HW, United Kingdom
Tel.: (0044) 1635 959 759
email: inquiries@expresspublishing.co.uk
www.expresspublishing.co.uk

First published 2024

Made in EU

ISBN 978-1-3992-1464-3

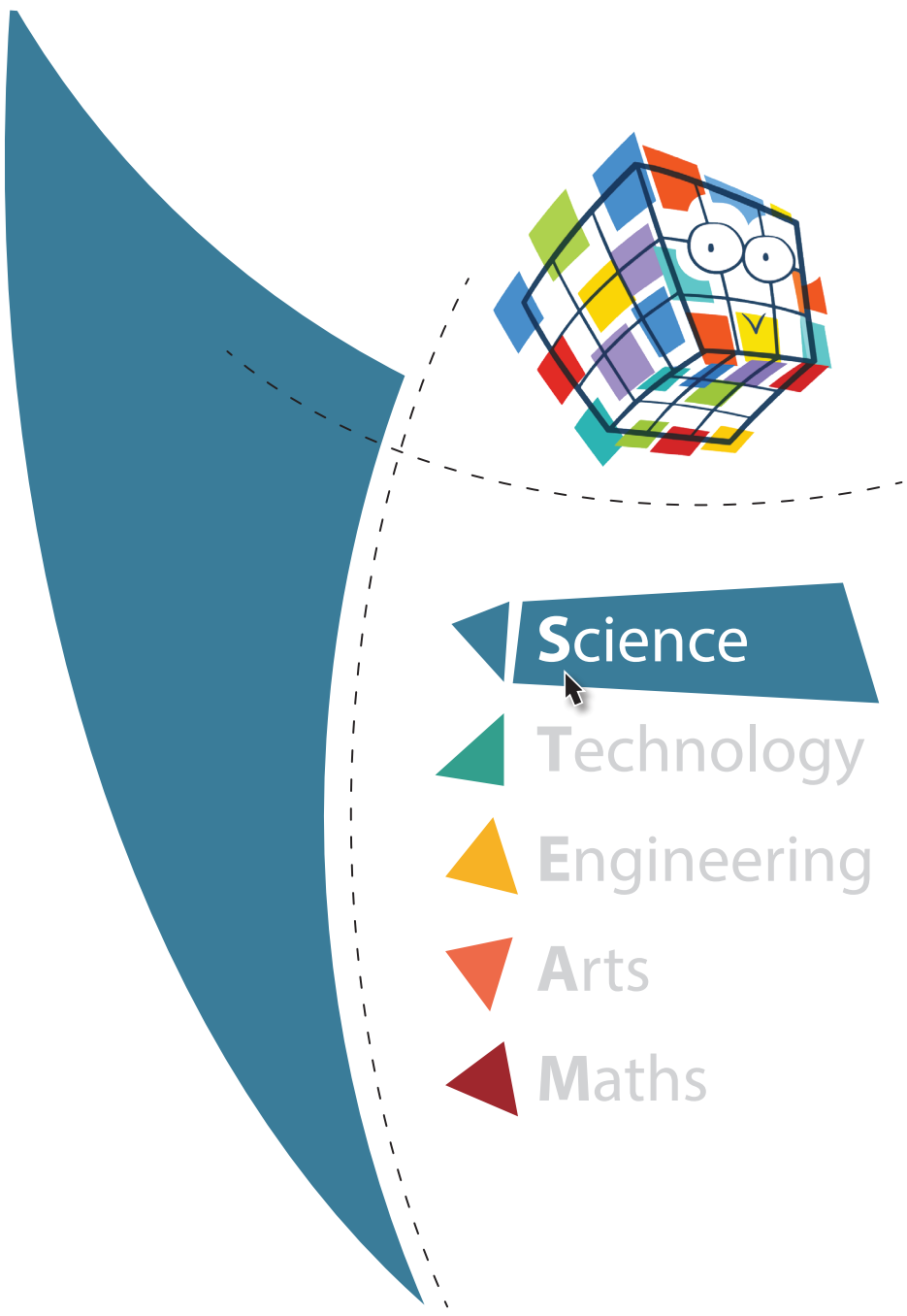
Acknowledgements

Author's Acknowledgements
I want to thank my colleagues and friends who helped me so much in carrying out the research, and gave me advice and valuable input. Special thanks to my family for their continuous support and trust. This book would not have been possible without them.
My sincere thanks also go to Jenny Dooley, the president of Express Publishing, who believed in me, trusted me and gave me this great opportunity to share my passion and dreams with the world.
I would also like to thank all the staff at Express Publishing who have contributed their skills to producing this book. Thanks for their support and patience are due in particular to: Megan Lawton (Editor in Chief); Vicky Shelman (senior editor); Vicky Travis (editorial assistant); Richard White (senior production controller); the Express design team; and those institutions and teachers who piloted the manuscript, and whose comments and feedback were invaluable in the production of the book.

Every effort has been made to trace all the copyright holders. If any have been inadvertently overlooked, the publishers will be pleased to make the necessary arrangements at the first opportunity.

CONTENTS

SCIENCE



STEAM (SCIENCE)

1

COLOURS COME FROM NATURE

Aim

'Where do colours come from?' To try and answer this question, let's do an experiment with things in the kitchen.

A iWonder

1 Can you name some colours? Compare with your partner.

_____

2 Where do colours come from?

_____

3 Can we make colours?

_____

B iImagine

4 Let's try an experiment. Look at the things below. How can we use them to make colours? Talk with your partner.

1 teaspoon of baking soda

1 red cabbage

a blender

1 teaspoon of turmeric

white coffee filters

a paintbrush

white vinegar

some sticky tape

a plastic knife

two glasses of water

DID YOU KNOW?

In the past, the colour purple was difficult to find in nature and very difficult to create so it was very expensive. In 1856, an English chemist, William Henry Perkin, created a synthetic purple paint. Later, they called it 'mauve' – the French name of a purple flower.

C iExplore

5 Let's do the experiment. What are the steps?

- Put the baking soda in a ¼ glass of water. Mix it well and leave it on the table.
- Cut the red cabbage into small pieces (ask for your teacher's help).
- Put the pieces in a blender. Add some water and blend.
- In another glass, put the turmeric in a ½ glass of water. Mix well.

D iObserve

6 What do you observe? Tell your partner.

1 What can you see?

_____

2 Can you paint with the yellow and purple colours?

_____

E iCreate

7 Let's make some paintings. Follow the steps.

- Use the yellow and purple paints you created to make paintings on the coffee filters.
- Use some sticky tape to put the paintings on a window where the sun can see them.
- Use the paintbrush to add some vinegar to some of the drawings and the baking soda with water to the other drawings.
- Leave them on the window for some days and complete the following table. Do the colours change? Do they stay the same?

	Yellow colour	Purple colour
Day 1		
Day 2		
Day 3		
Day 4		
Day 5		
Day 6		
Day 7		

F iEvaluate

8 Answer the questions.

1 How can we create colour from food?

_____

2 What happens to natural colours if they are in the sun for a long time?

_____

❖ Complete the Evaluation Form at the back of the book.

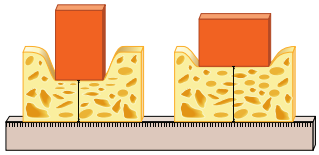
STEAM (SCIENCE)

2

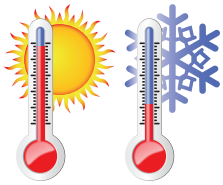
EGG IN A BOTTLE

Aim

'What is air pressure?' To try to answer this question, let's do an experiment with a boiled egg.



pressure: how much force something puts on something else



temperature: how hot or cold something is

hot: that has got a high temperature

cold: that has got a low temperature

A iWonder

1 Try this:

- Take a bottle of water and take the cap off.
- Put a piece of cardboard on the mouth of the bottle.
- Turn the bottle upside down and take off your hand.
- What do you notice?

_____

2 What's inside these objects? Talk with your partner.

a car tyre

a balloon

a hot-air balloon

3 The experiment in Ex. 1 and the pictures show air pressure. Try to explain what air pressure is to your partner.

_____

B iImagine

4 Let's try an experiment. Look at the things below. How can we use them to understand air pressure better? Talk with your partner.

a boiled egg

a glass bottle

2-3 birthday candles

a lighter

an egg cup

DID YOU KNOW?

Air is all around us but we can't see it. When we heat the air, it takes up more space and air pressure is stronger. When we cool it, air pressure becomes less strong.

C iExplore

5 Let's do the experiment. What are the steps?

- Boil an egg for 7-10 minutes. Take the shell of the egg off.
- Now, put the egg on the opening of the bottle. Can the egg get inside the bottle?

_____

- Now, turn the bottle upside down.
- Put the egg in an egg cup (if you want) and then, put the candles on the top of the egg.
- Light the candles. Ask your teacher to help you with this.
- Put the bottle over the candles and the egg. Wait for a while. What happens?

_____

D iObserve

6 What do you observe? Tell your partner.

What happens to the egg? Try to fill in the table.

Time (seconds)	Where is the egg? *(in, under, on)*

E iCreate

7 In pairs, draw the experiment in the box below.

F iEvaluate

8 Answer the question.

How does the egg get into the bottle? Use your own words.

_____

❖ Complete the Evaluation Form at the back of the book.

3 STEAM (SCIENCE)

SCIENCE BEHIND FUN TRICKS

Aim

'Is there science behind fun tricks?' To try and answer this question, let's do an experiment.

trick: a clever or unusual action that a person does to entertain or surprise people

flow: (for water) to move continuously in one direction

A iWonder

1 Can you do a fun trick?

_____

2 What's the science behind the fun trick you can do?

_____

B iImagine

3 Let's try an experiment. Look at the things below. How can we use them to do a fun trick? Talk with your partner.

some clear sticky tape

a drawing pin

some duct tape

an empty plastic water bottle without the label

a baking tray

some water

a laser pointer

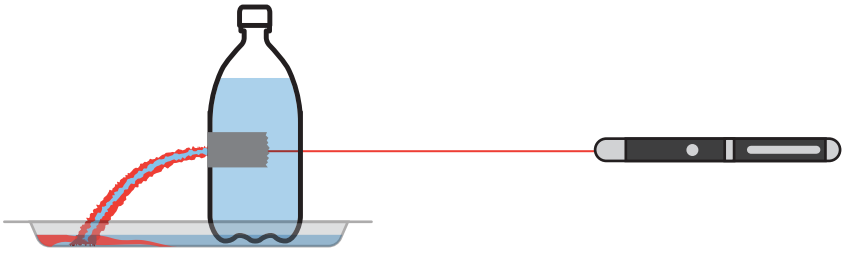
DID YOU KNOW?

There are lots of fun tricks you can do to surprise your friends and make them laugh. But fun tricks are just science!

C iExplore

4 Let's do the experiment. What are the steps?

- Put a small piece of duct tape near the middle of the empty plastic water bottle.
- Use a drawing pin and make a hole in the centre of the duct tape. The teacher can help you with this.
- Cover the hole with some clear sticky tape.
- Fill the bottle with water.
- Put the bottle on a tray.
- Remove the clear sticky tape. Water flows out of the bottle through the hole.
- Turn on the laser pointer and put it on the opposite side of the hole*. Look at the shiny stream of water.



* Be careful! Always keep the laser pointer away from a person's head and eyes!

D iObserve

5 What do you observe? Tell your partner.

1 What can you see?

_____

2 What does the light do?

_____

3 Turn off the lights. Is it different?

_____

E iCreate

6 Work in pairs. Draw the steps of the experiment on 7 cards. Student A reads the cards and Student B does the experiment. Present the experiment at a school celebration.

F iEvaluate

7 Read the sentences and write *T* (True) or *F* (False).

- The light travels with the water. ☐
- We can do this experiment with the light of the sun. ☐
- We can do this experiment with an empty bottle. ☐
- We can do this experiment with water or juice. ☐

❖ Complete the Evaluation Form at the back of the book.

STEAM (SCIENCE)

4

CAN FLOWING WATER BE STILL?

Aim

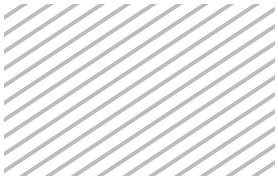
'Can flowing water be still?' To try and answer this question, let's do an experiment.

flowing water: water that comes out of a tap

tap: the object that controls the flow of the water

still: not moving at all

straight line



parallel: (for two or more lines) that go in the same direction and have the same distance from each other

splash: (for water) to go in all directions

A iWonder

1 Can water that flows from a tap be still?

_____

2 Try this: turn the tap on. Let the water flow very slowly. Watch the water. Does it splash? Is it still?

_____

B iImagine

3 Let's try an experiment. Look at the things below. How can we use them to see if flowing water can be still? Discuss in pairs.

a balloon

some duct tape

some water

a plastic bowl

a safety pin

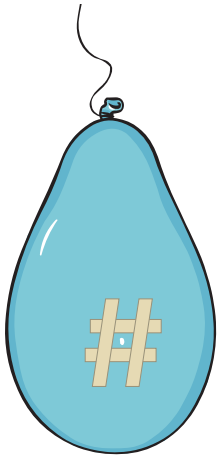
DID YOU KNOW?

When water flows slowly and gently from a tap, it moves in straight parallel lines. But if it flows quickly from a tap, it splashes around.

C iExplore

4 Let's do the experiment. What are the steps?

- Fill the balloon with water and tie the end.
- Put the balloon inside the bowl.
- Put the duct tape on the balloon in the shape of a hashtag (#). Leave an empty spot in the centre of the hashtag (see sketch).
- Ask your teacher to use the safety pin to make a hole in the centre of the hashtag.
- The water starts flowing from the hole.



D iObserve

5 What do you observe? Tell your partner.

1 What can you see?

_____

2 What is happening?

_____

3 Why is this happening? Discuss in pairs.

_____

E iCreate

6 Use the box below to draw your experiment. Present your drawing to the class and explain what is happening and why.

F iEvaluate

7 Answer the questions.

1 What do you know about water now?

_____

2 Is this an easy experiment? What are its difficult parts? What do you need to be careful about?

_____

❖ Complete the Evaluation Form at the back of the book.

STEAM (SCIENCE)

5

THE BOAT THAT DOESN'T SINK

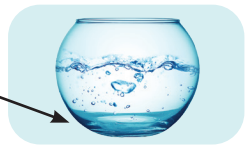
Aim

'What does the water do? What does the air do?' Let's do an experiment to find out how we can keep the air under the sea.

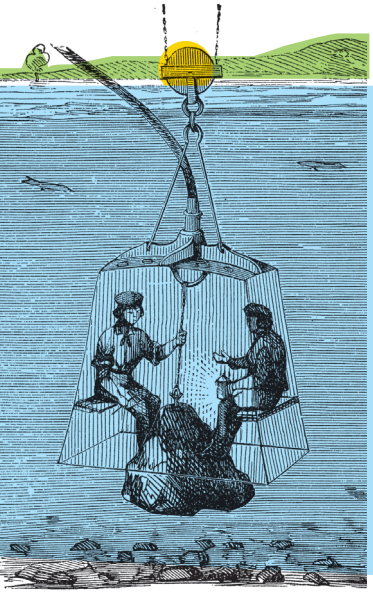
sink: to go under the water

float: to stay on the water

bell: a metal object that usually makes a sound



bottom: the lowest side of something



A iWonder

1 Look at the picture and, in pairs, answer the questions.

1 Where are the people?

_____

2 What are they in? What does it look like?

_____

3 Is this 'box' full of water? Can the people breathe?

_____

4 How long can people breathe underwater?

_____

B iImagine

2 Look at the things below. What can you make with these? (The title of this lesson can help you.)

a clear glass

some water

a piece of paper (7 cm x 10 cm)

a bowl

3 Can you draw the object you will make with the piece of paper in the box below? Work in pairs.

DID YOU KNOW?

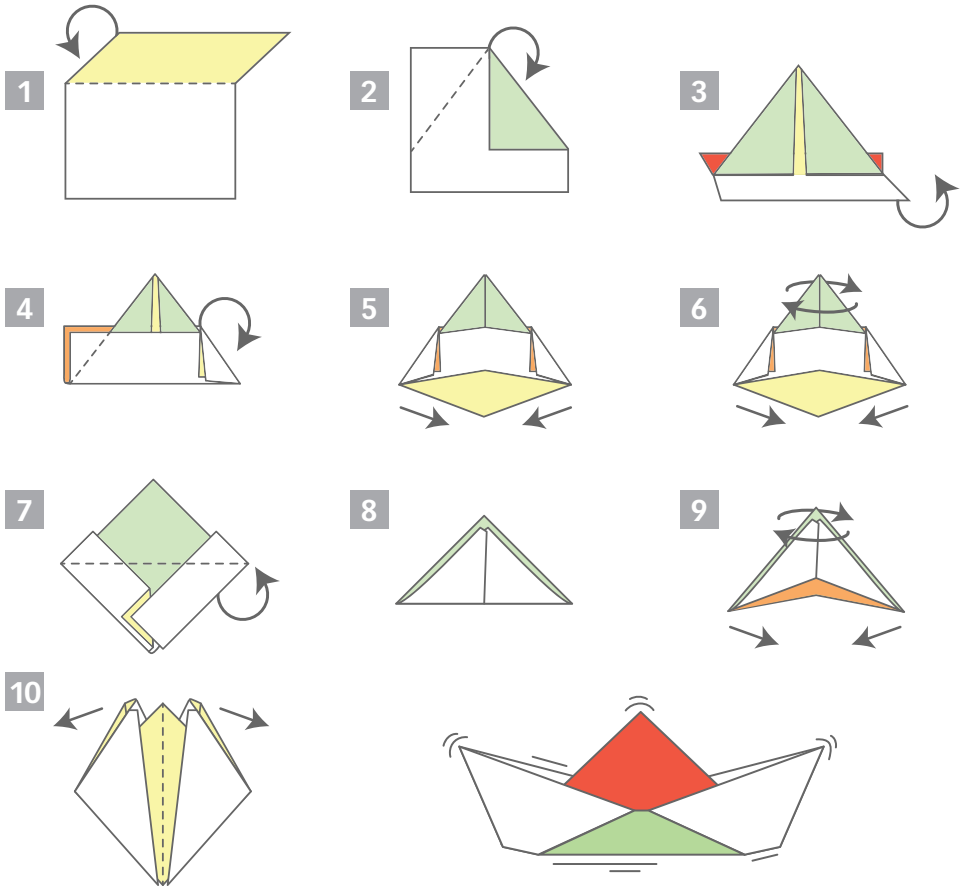
People can use a diving bell to go underwater. It's called a diving bell because it looks like a bell. It can go to the bottom of the sea. It keeps the air inside.

C iExplore

4 Let's do the experiment. What are the steps?

- Use the piece of paper to make a small paper boat. See how below.

Instructions: How to make a paper boat



- Fill the bowl with water and put the paper boat on the water. Does it sink or does it float? _____
- Now, put the glass over the boat.
- Push the glass to the bottom of the bowl slowly.
- Then, pull it up slowly.

D iObserve

5 What do you observe? Tell your partner.

1 What can you see?

_____

2 Is the paper boat wet?

_____

3 Is there water in the glass?

_____

4 Is there air in the glass?

_____

E iCreate

6 Can you draw the experiment? In the box below, draw the bowl of water, the boat and the glass. Draw arrows and write what each object is. Don't forget to write what's in the glass: air or water?

7 Do you know another way people can travel underwater? Draw it in the box below.

F iEvaluate

8 Answer the question.

Why doesn't the boat sink?

_____

iExtend

Try this experiment.

- Fill the bowl with water and put a ping pong ball on the water.
- Take a plastic or paper cup and make a hole in the bottom.
- Now, put the cup over the ping pong ball.
- Keep your finger on the hole at the bottom of the cup.
- Push the cup to the bottom of the bowl slowly.
- Then lift your finger from the hole and see what happens.

❖ Complete the Evaluation Form at the back of the book.

The REAL STEAM

Pre A1

The REAL STEAM is a five-level series for students at CEFR levels Pre-A1 to B2 that promotes experiential and holistic language learning through STEAM activities. Students carry out a variety of scientific experiments, engineering projects, mathematical calculations and art projects, all carefully tailored to their language level. The series provides hands-on activities for students to explore the STEAM world through six collaborative steps: *iWonder* (asking questions), *iImagine* (preparing for the activity), *iExplore* (doing the activity), *iObserve* (making observations), *iCreate* (presenting results) and *iEvaluate* (analysing results).

Components

- Student's Book
- Teacher's lesson plans (downloadable)

Express Publishing

ISBN 978-1-3992-1464-3