Engage Teacher Conference

Unlocking STEM for all: accessible CREST resources to support inclusion

Explore how CREST can engage learners with SEND, learn inclusive principles for STEM resources, and preview new accessible challenges!

Catherine Davies
Education Resources Manager, British Science Association

Sarah Sephton
Education Team Placement Student, Kings College London STEM Education MA student

Engage Teacher Conference

Engage

.Welcome, please be aware:

- Talks are recorded
- There will be time for questions at the end
- You can send messages in the chat or raise your hand.

CREST AWARDS

Engage Teacher Network

KING'S College LONDON

Unlocking STEM for all: accessible CREST resources to support inclusion

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Education Resources Manager
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Session outline

- Welcome and housekeeping

- Using CREST to support inclusion

- CREST resources designed for SEND learners and their educators

- The guiding principles of inclusive STEM resources

- Building on what's currently available: a preview of the latest new accessible CREST resources coming soon!

- Q&A

Using CREST to support inclusion

All CREST challenges and projects are designed to be **flexible and student-centred**, allowing you to **tailor the briefs and activities** to the needs of your learners

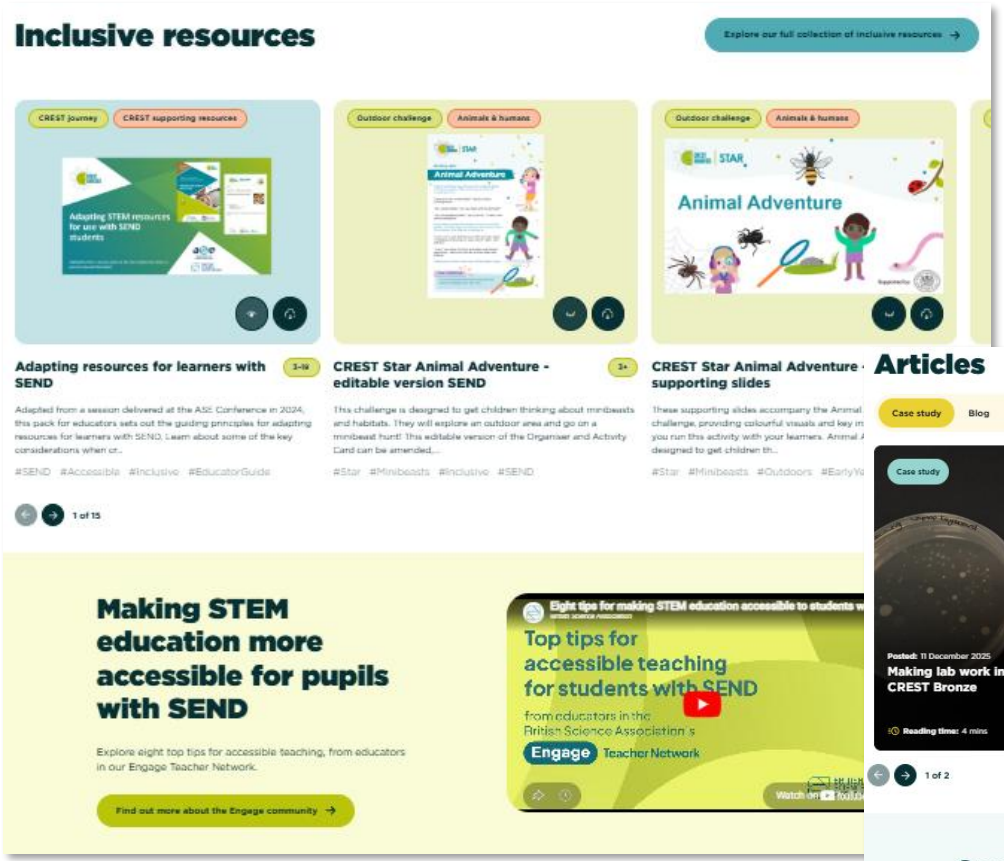
Relatable contexts, real life scenarios and **adjustable age ranges** mean that CREST can be accessed by all

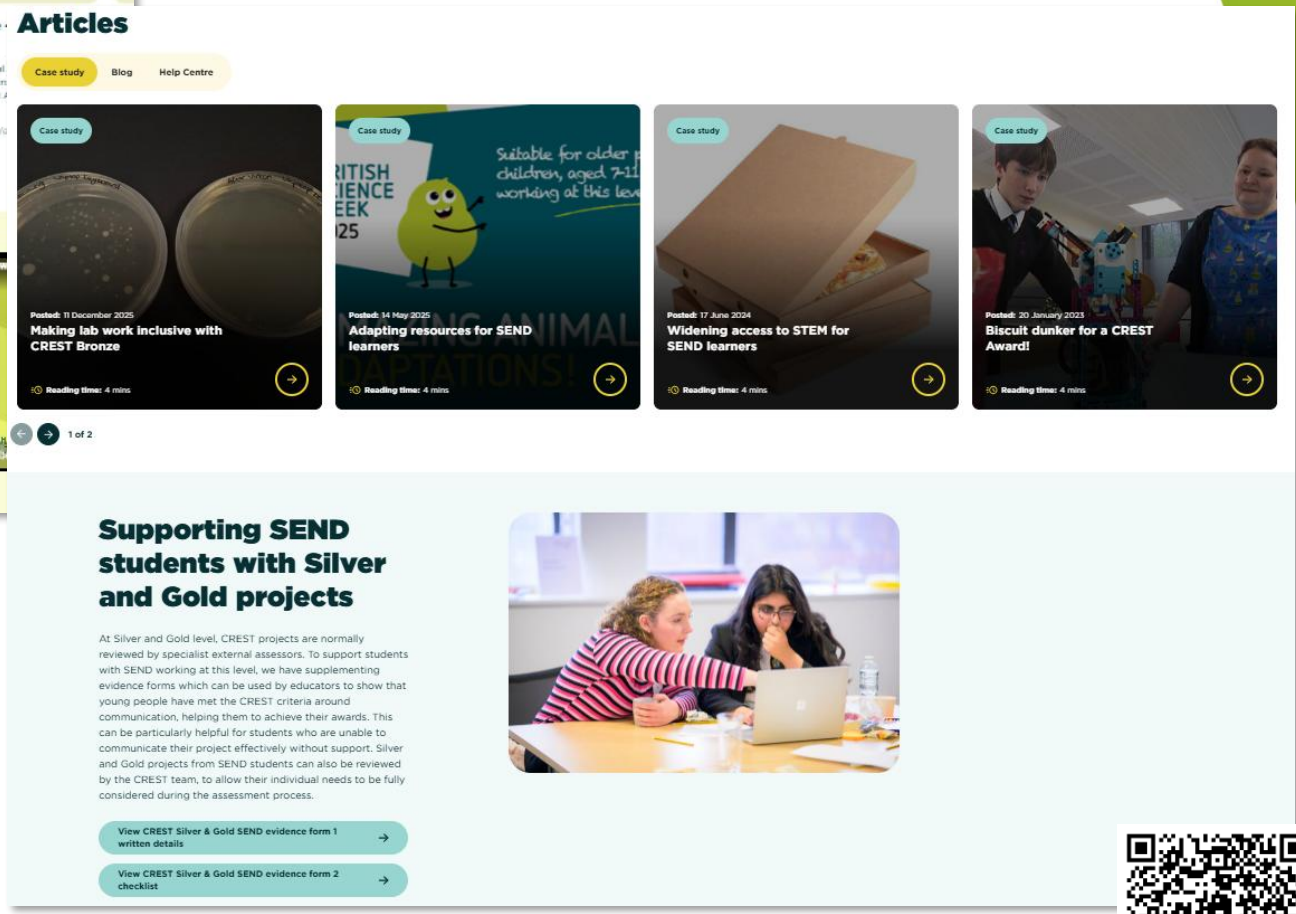
For students working at Silver and Gold level, we also offer **alternative evidence forms and flexible assessment arrangements**, supporting young people with SEND to achieve their Award

Find more general guidance on how to run CREST on our website:
https://www.crestawards.org/about-crest/how-to-run/

Supporting webpages for educators at primary and secondary level

primary





Dedicated primary and secondary SEND pages on the CREST website include resources, video guidance, case studies and blogs to support your practice

secondary

Resources designed specifically for SEND learners

The online CREST Resource Library also includes a dedicated landing page for SEND resources:

https://www.crestawards.org/resource-library/send/

Our tailored accessible resources include a Bronze level 'Design and Make a Pizza Box' project, an accessible collection of Star challenges with editable supporting classroom slides, as well as general guidance around adapting resources for SEND students.

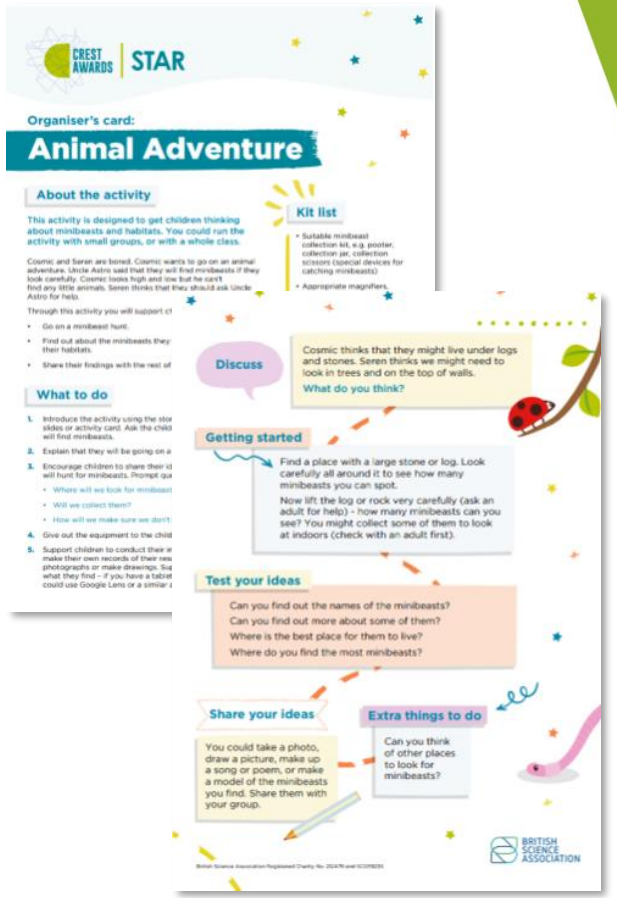
We are currently working on expanding and developing this bank of inclusive resources.

Animal Adventure: an accessible Star level challenge

Animal Adventure is a Star level challenge aimed at learners with a working age of 3-7, and takes around 45 minutes to run

The challenge prompts pupils to investigate an outdoor environment, observing and exploring minibeasts and their habitats.

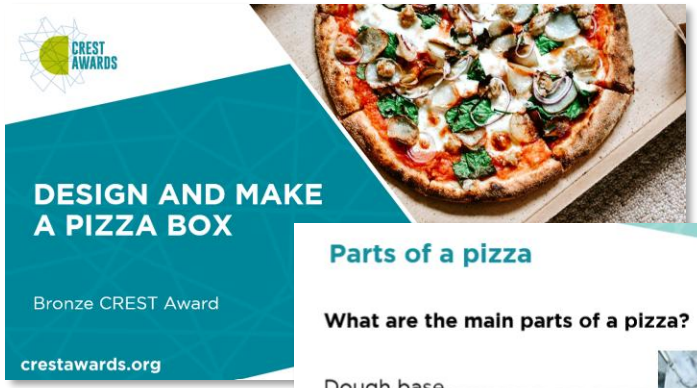
Editable Organiser and Activity Cards mean that the challenge can be adapted as needed

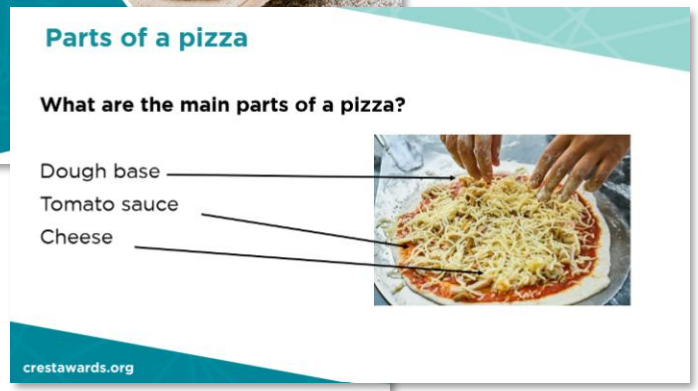


Accompanying classroom slides can also be edited and used to introduce the activity and support learners' understanding

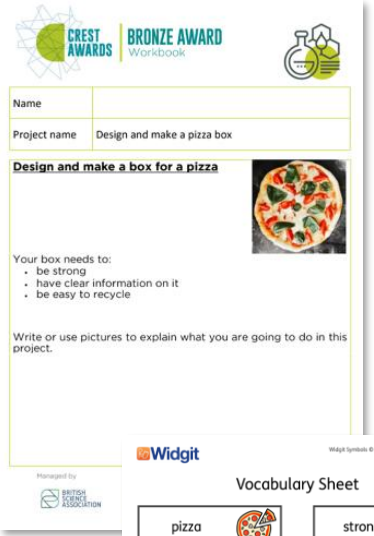
Design and make a pizza box: an accessible Bronze level challenge

This Bronze level challenge is a 10-hour project aimed at learners with a working age of around 11+



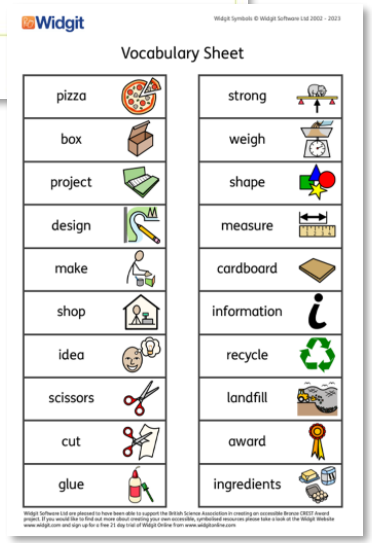


The challenge prompts pupils to explore pizza packaging, before designing and making their own strong pizza box



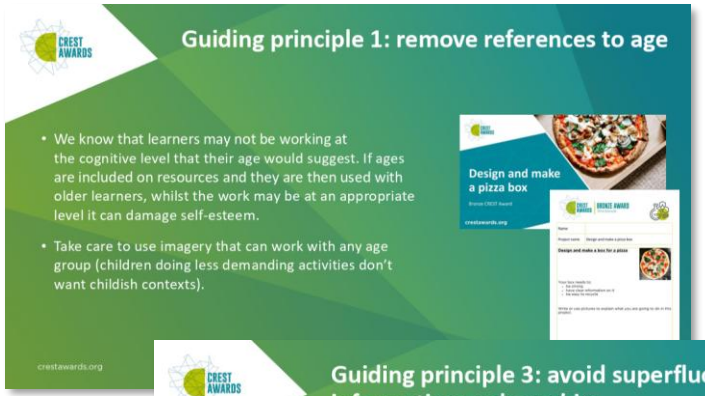
A structured student workbook acts as a frame and allows learners to record their progress as they work through the project

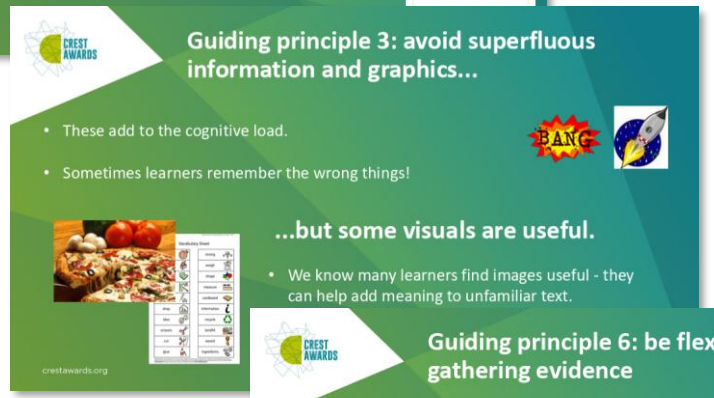
A supporting Widgit vocabulary sheet is available to support understanding

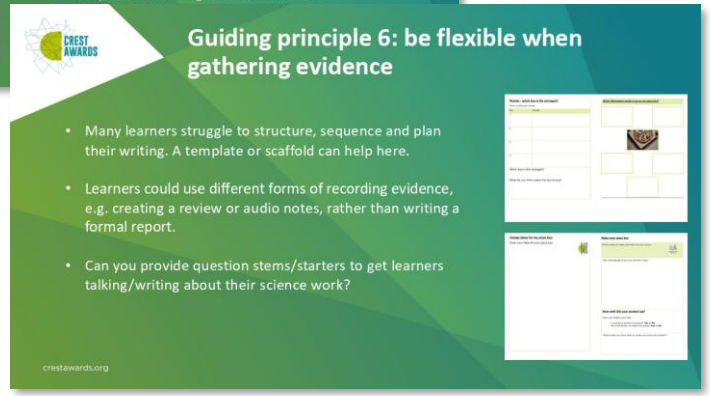


Accompanying classroom slides can also be edited and used to introduce the activity and support learners' comprehension

The guiding principles behind accessible STEM resources







ards.org

New accessible CREST resources – coming soon!

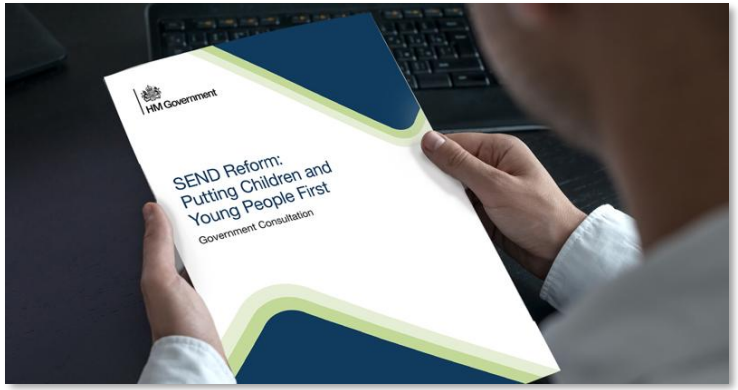
Sarah Sephton - Education Team Placement Student

Background:

- Chemistry teacher (20+ years)
- Sixth Form Leadership Team
- MA in STEM Education at King's College
- Principles and Policies, Quantitative Methods, Making and Creating, Work Placement and dissertation
- Other ways of learning and engaging in science

Phase 1: The literature review

- Inclusive teaching is fundamentally good for all learners
- One in three children identified with SEND at some point in their learning (DfE, 2026, p. 47)
- Quality adaptive teaching with high expectations – know children well



Department for Education

(2026, February 23)

Every Child Achieving and Thriving

GOV.UK

Phase 1: The literature review

What does best practice look like when applied to STEM resources?

Readability	Structure	Multi-modal approaches	Science capital	Strengths-based approaches
• Text size / font • Sentence length • Considered vocabulary • Use of supporting symbols, e.g. Widgit	• Frames and scaffolding • Chunking • Now/next prompts	• Use of drama, storytelling, dance, music to explore and explain concepts and learning • Build in opportunities for sensory activities	• Familiar and relatable contexts • Connect the learning to students' experiences	• Flexibility • Alternative formats for gathering evidence • Learner voice / student-led learning

Phase 2: Audit of existing resources / selecting next for adaptation

Consulting with educators – teacher focus group

Flexibility
- Editable versions of resources
- The ability to adapt activities to the individual needs of learners

Images and symbols
- High quality photo images
- The ability to add suitable symbols to ensure understanding

Engaging contexts
- Opportunities to make connections with students' own experiences
- Fun, flexible, hands-on challenges with outdoor options

Easy to resource
- Activities that require easy to source materials
- Flexibility around equipment to ensure it's appropriate for the learners

Phase 3: adaptation

We are now in the next phase of the project, developing a new collection of SuperStar Challenges (for students working at age 7-11) and an adapted Discovery Day (for students working at age 10-14).

Adaptations will include:

- Editable resources for flexibility
- Any reference to learner age removed from student facing materials
- Simplified steps and instructions
- Supporting classroom slides, including key prompts, vocabulary and photo imagery
- Scaffolds, frames and suggestions for alternative ways to capture evidence
- More suggestions for linked sensory and multi-modal activities

New accessible CREST SuperStar resources – a preview!

CREST SuperStar

Brilliant Birds

CREST SuperStar

Bumblebee Mystery

CREST SuperStar

Crafty Rafts

CREST SuperStar

Playground Games

CREST SuperStar

Racing Rockets

CREST SuperStar

Recycle Reuse

CREST SuperStar

Tumbling Toast

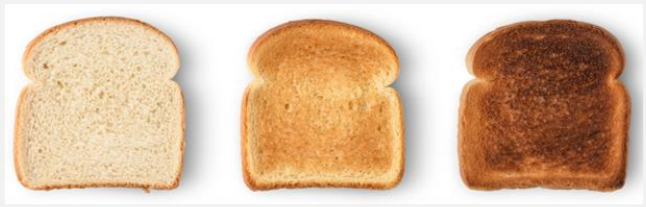
CREST SuperStar

Worm Charming

New accessible CREST SuperStar resources – a preview!

CREST SuperStar

Tumbling Toast



Butter-side down

SuperStar Town Mayor is a busy person.

Every morning on her plate, she has two pieces of toast.

But she moves around while eating and one piece always falls on the floor.

She says, "The toast always lands butter-side down."

Is this true? Does toast always land butter-side down?

Can you help the Mayor?

Your challenge

1. Drop a piece of toast on the floor. Which way does it land?
2. Change the height that you drop it. Does that make a difference?
3. Change the spread on the toast. Does that make a difference?
4. Compare your results

New accessible CREST SuperStar resources – a preview!


CREST AWARDS | SUPERSTAR

Tumbling Toast
Activity Card

Startown's Mayor, Councillor Imin A Quandary, is calling on all children to settle a dispute she is having with her secretary, Dayley Diary.

"You see, I'm always in a hurry so only have time for a couple of pieces of toast for breakfast. But every day I manage to drop a piece off my plate and onto the floor. The toast always seems to land butter-side down! It is such a nuisance. Dayley tells me it's just Murphy's Law – if something can go wrong, it will go wrong – but I think there's a reason. What do you think? Does toast always land butter-side down? Can you help me?"

Your challenge

Help Mayor Quandary to find out if toast really does always land butter-side down. Is there anything you can do that makes a difference to which way it falls?

Discuss

Have you ever dropped toast?
Which way did it fall?
Have you heard of Murphy's Law about toast?
Do you think that you could find a way to test it?

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Getting started

Start by finding out what happens when you drop buttered and non-buttered toast.
Then try other ideas.
Don't forget to try to keep your test fair.
You may need to do each test lots of times.
Will you need to record anything?

Test your ideas

People normally drop toast off a plate.
Does the height make a difference?
What if it is a very small piece?
What if you put anything else on the toast?
What will happen without butter?
Think about your investigation and then get toasting.

Share your ideas

Compare your ideas with other groups. Did you all get the same answer? What advice would you give to Mayor Quandary? You could write her a letter.

Extra things to do

Find out about other people who have tested toast. Did they get the same answer as you?

Find out about other sayings such as 'Red sky at night, shepherd's delight', 'Soaking conkers in vinegar makes them stronger', and 'Putting the milk in first is better when you make a cup of tea' etc.

Try testing some of them.

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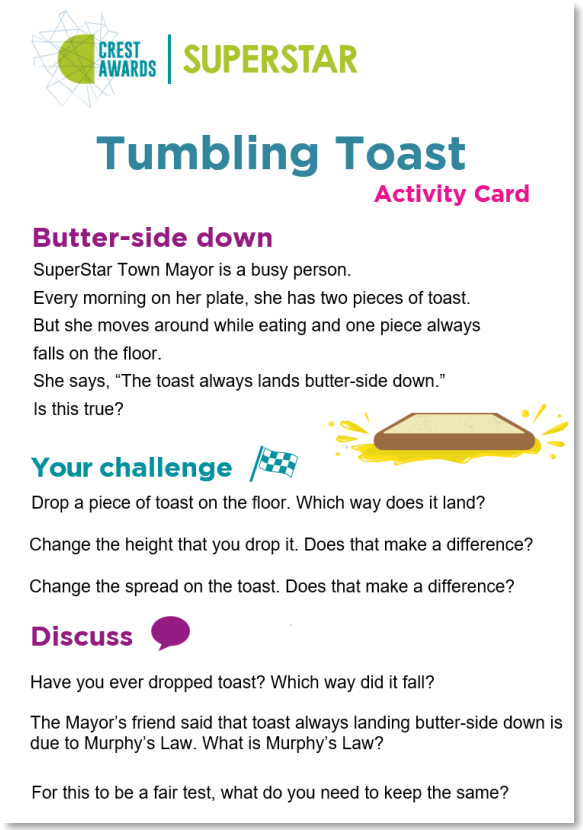

CREST AWARDS | SUPERSTAR

Tumbling Toast
Activity Card

Butter-side down

SuperStar Town Mayor is a busy person.
Every morning on her plate, she has two pieces of toast.
But she moves around while eating and one piece always falls on the floor.
She says, "The toast always lands butter-side down."
Is this true?

Your challenge

Drop a piece of toast on the floor. Which way does it land?

Change the height that you drop it. Does that make a difference?

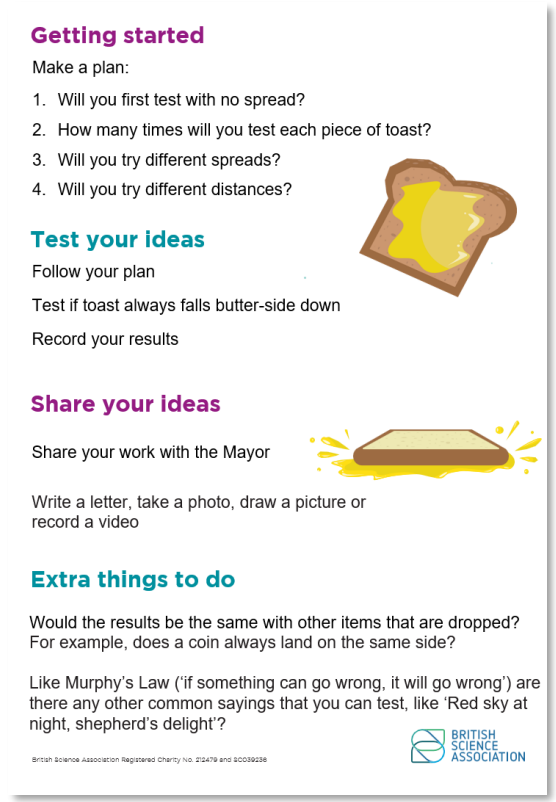
Change the spread on the toast. Does that make a difference?

Discuss

Have you ever dropped toast? Which way did it fall?

The Mayor's friend said that toast always landing butter-side down is due to Murphy's Law. What is Murphy's Law?

For this to be a fair test, what do you need to keep the same?


Getting started

Make a plan:

1. Will you first test with no spread?
2. How many times will you test each piece of toast?
3. Will you try different spreads?
4. Will you try different distances?

Test your ideas

Follow your plan

Test if toast always falls butter-side down

Record your results

Share your ideas

Share your work with the Mayor

Write a letter, take a photo, draw a picture or record a video

Extra things to do

Would the results be the same with other items that are dropped? For example, does a coin always land on the same side?

Like Murphy's Law ('if something can go wrong, it will go wrong') are there any other common sayings that you can test, like 'Red sky at night, shepherd's delight'?

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New accessible CREST SuperStar resources – a preview!

CREST AWARDS | SUPERSTAR

Tumbling Toast

Organiser's Card

About the activity

This activity is designed to get learners thinking about probability.

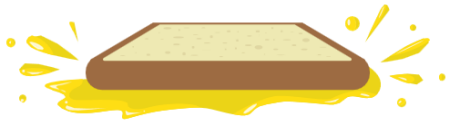
The Mayor seems to drop her toast butter-side down every morning, and she can not work out why. Her friend thinks it is Murphy's Law but she is not so sure. Can the investigators help?

Through this activity you will support your group to:

- Think about the world around them from a different perspective
- Record their thoughts and ideas and present them to share with the group

Kit list

- Bread - supermarkets often sell off sliced bread at the end of the day. Try to get thick and thin slices.
- Toasters (PAT tested), or toast
- Knives
- Butter (cheap margarine is fine)
- Cardboard or plastic plates
- Newspaper as a landing pad
- Jam or other spread (optional)
- Marker pens
- Recording grid with three columns - type of toast, landed butter-side down, landed butter-side up (optional)



What to do

1. Read the activity sheet familiarise yourself with the activity.
2. Check the kit list to ensure you have the correct resources.
3. Set the scene by discussing the Mayor's problem. Talk a little about Murphy's Law to make sure that the learners understand it.
4. Give learners time to discuss what they know about Murphy's Law and their experience of dropping toast.
5. Give learners time to work out their plan. Tell them that they have limited resources so they need to plan carefully.
6. Remind learners about being careful if they make the toast themselves.
7. Get them investigating. Start them off with comparing toast with and without butter. Then let them test other factors such as the height, the size of the bread, other spreads, how they drop it, etc.
8. They may find it helpful to mark the unbuttered toast each side with a marker pen so that they know which side is which.
9. Some learners may need a bit of support but let them try things out first.
10. Remind them to keep notes of what is happening.
11. Give learners about 20 minutes for their testing.
12. Give them a few minutes when they have cleared up to check their ideas before sharing their findings with the rest of the group.
13. They could make a display of all their toast samples and the outcomes.
14. They could share their findings with the Mayor suggesting what she might do. Encourage them to be as creative as possible.
15. There are extra challenges on the activity sheet. These can be used if there is any spare time or if the learners want to try out more ideas at home and earn a bonus sticker.

Things to think about

In this activity fair testing is important. If learners are looking at the size of toast slices, they need to keep the way they drop it the same. If they are looking at the height of the drop, they need to keep the toast slices the same.

To get reliable results each test needs to be repeated several times (20 is often recommended) to avoid the outcome being just chance.

Watch out for fire detectors if you are making toast.

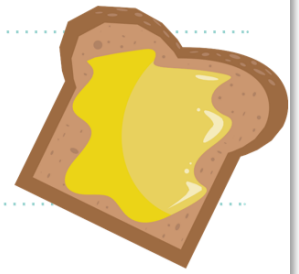
Take it further

The way toast lands has long been of interest. An internet search reveals many investigations looking into this question. It seems that there is a scientific explanation for why it does land on the buttered-side.

It is all to do with how much a piece of bread can rotate as it falls. If the distance is increased, then it can do a complete rotation and land buttered-side up!

It has been suggested that if the slice of toast is very small (less than 3 cm) it is able to complete the rotation before landing.

Encourage the learners to come up with some creative ideas to help the Mayor, such as attaching the toast to the back of a cat as they always land right side up!



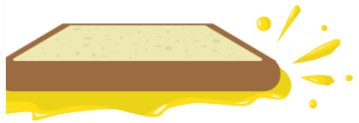
Keywords

- Tumbling
- Toast
- Fair test
- Murphy's Law
- Probability

Watch out!

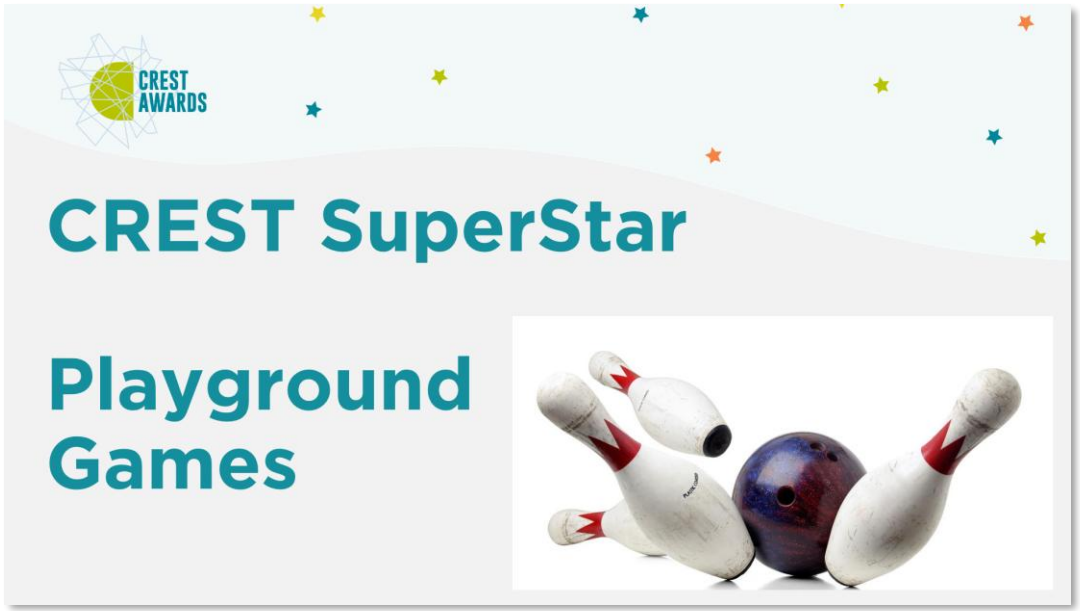
Remind learners not to eat the toast.

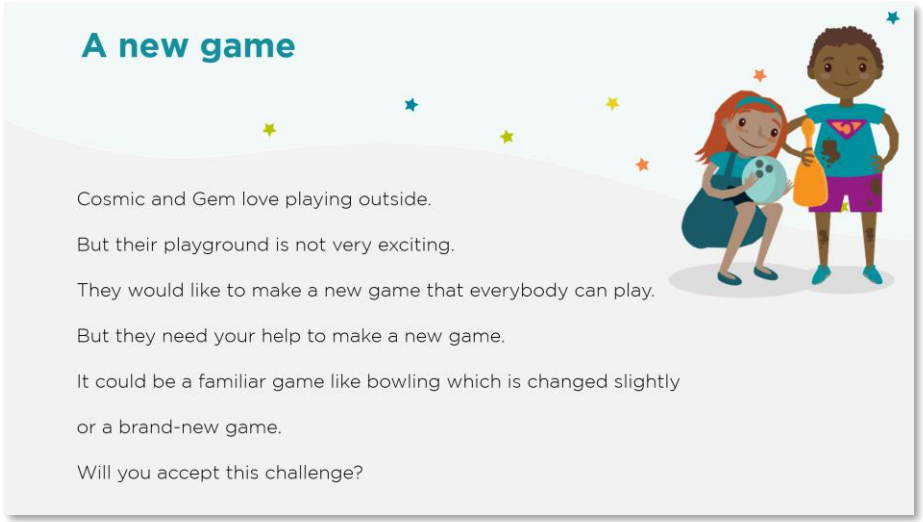
Only use toasters under very close supervision otherwise provide pre-made toast.

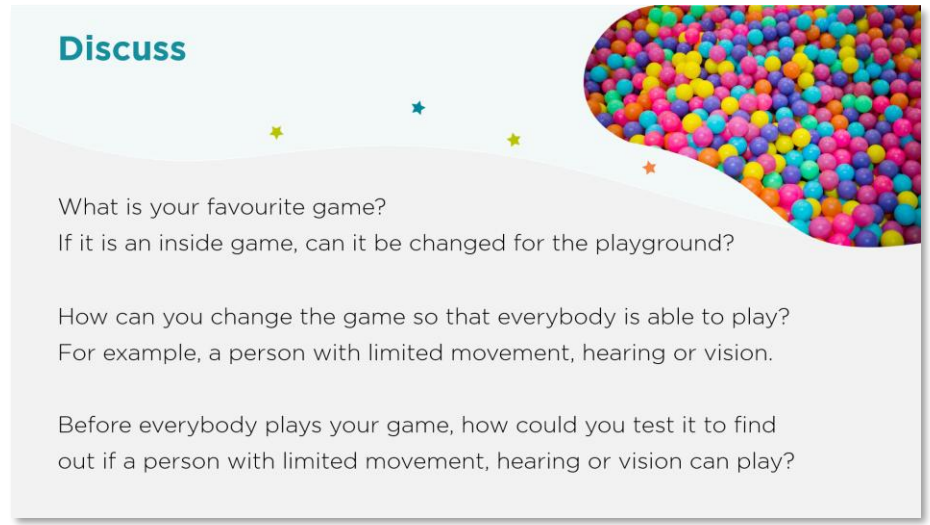


BRITISH SCIENCE ASSOCIATION

New accessible CREST SuperStar resources – a preview!







New accessible CREST SuperStar resources – a preview!

CREST AWARDS | SUPERSTAR

Playground Games

Activity Card

Cosmic and Gem have made a ten-pin bowling game. They love playing it! They want their friend Lyra to be able to join in. Lyra has low vision. Cosmic thinks that they can change the game so that they can all play together.

"Perhaps we could wear some special glasses so we see the game in the same way that Lyra does" says Gem.

What do you think they can do?

Your challenge

Create a set of playground games that can be played together by children, with and without disabilities.

Discuss

Try bowling while wearing low-vision simulators. What difference does it make? In what ways can you change the game to make it easier for everyone to play together?

Lyra was wondering if you can think of ideas for other games that children with and without disabilities can play.

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Getting started

How well are outdoor games designed for children who have low vision or difficulty hearing, have limited movement or use a wheelchair?

Research games that people with disabilities play, for example Goalball.
Try out one of these games.

What games can you play outdoors? Are there any markings for games?

What could you do so that more children can join in?

What new games can you create? What rules will your games have?

How will you make sure your games are safe?

Now test your games. How accessible are they? If you do not have a disability, you may need to try your games by using low-vision simulators, ear muffs, sitting in a chair, and so on.

To do your tests you will need:

Games equipment such as bean bags, balls, cones, poles, and so on.

Bells and other noise-makers

Torches and other lights

Limited-vision simulators – try very dark sunglasses; goggles covered with tissue with a small peep-hole cut in it; or your own glasses with one lens covered

Ear muffs

Some of your fellow investigators have had a few ideas to get you started:

I am going to use catching nets for rounders, to make it easier to catch the ball.

We could use a sound-maker on a game to help us find a target.

We could attach a bell to a beanbag or ball. I wonder if we can throw it to each other wearing a blindfold.

We could use a flashing light instead of a sound to start races.

We could try playing volleyball or tennis sitting on the ground instead of running around.

What will you do?

Share your ideas

Create a plan of your ideal playground with games marked on it. You could share it with adults – they may like to use your ideas!

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CREST AWARDS | SUPERSTAR

Playground Games

Activity Card

A new game

Cosmic and Gem love playing outside.

But their playground is not very exciting.

They would like to make a new game that everybody can play.

But they need your help to make a new game.

It could be a familiar game like bowling which is changed slightly or a brand-new game.

Will you accept this challenge?

Your challenge

Make a playground game that can be played by everybody

Make the rules of the game clear

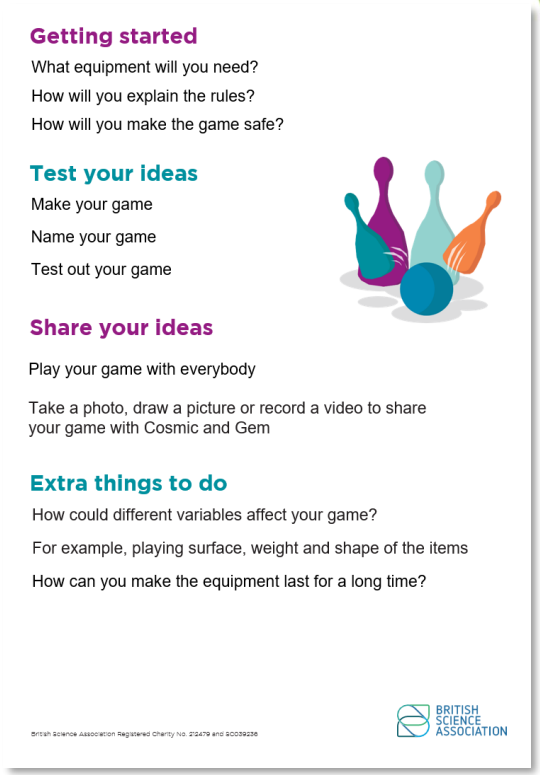
Try the game

Discuss

What is your favourite game?

If it is an inside game, can it be changed for the playground?

How can you change the game so that everybody is able to play?



Getting started

What equipment will you need?

How will you explain the rules?

How will you make the game safe?

Test your ideas

Make your game

Name your game

Test out your game

Share your ideas

Play your game with everybody

Take a photo, draw a picture or record a video to share your game with Cosmic and Gem

Extra things to do

How could different variables affect your game?

For example, playing surface, weight and shape of the items

How can you make the equipment last for a long time?

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New accessible CREST SuperStar resources – a preview!

CREST AWARDS | SUPERSTAR

Playground Games
Organiser's Card

About the activity

This activity is designed to get learners thinking about different disabilities and creating games that are accessible and inclusive.

Cosmic and Gem love playing outside and would like to make the playground more exciting by making a new game.
Can the investigators find some accessible games?

Through this activity you will support your group to:
- Design games to take into account the needs of different players
- Evaluate their games

Kit list

- Games equipment such as bean bags, balls, cones, poles etc.
- Bells and other noise makers
- Torches and other lights
- Ear plugs
- Low-vision simulators etc.

What to do

1. Read the activity card to familiarise yourself with the activity.
2. Check the kit list and ensure you have a good range of resources available.
3. Set the scene by discussing learners' experiences with games.
4. Help learners to decide what they can do to understand more about how certain games might limit access to learners.
5. Help learners to collect resources.
6. Give learners plenty of options when they research different inclusive sports e.g. using internet, books and leisure centre visit.
7. Ensure learners think about how ideas can be tested safely.
8. Ask the learners to play their games with the rest of the group and evaluate.

Things to think about

Encourage learners to consider how different variables affect their game, for example, playing surface, weight and shape of the items and how the equipment can be made so that it lasts a long time.

Encourage learners to consider a wide range of disabilities. For example, to experience limited vision you can paint different markings on goggles, block the central area of vision, block the whole lens apart from a small peep-hole or stick patches of translucent or opaque paper on the lenses.

Keywords

- Game
- Playground
- Equipment
- Limited
- Variable

Watch out!

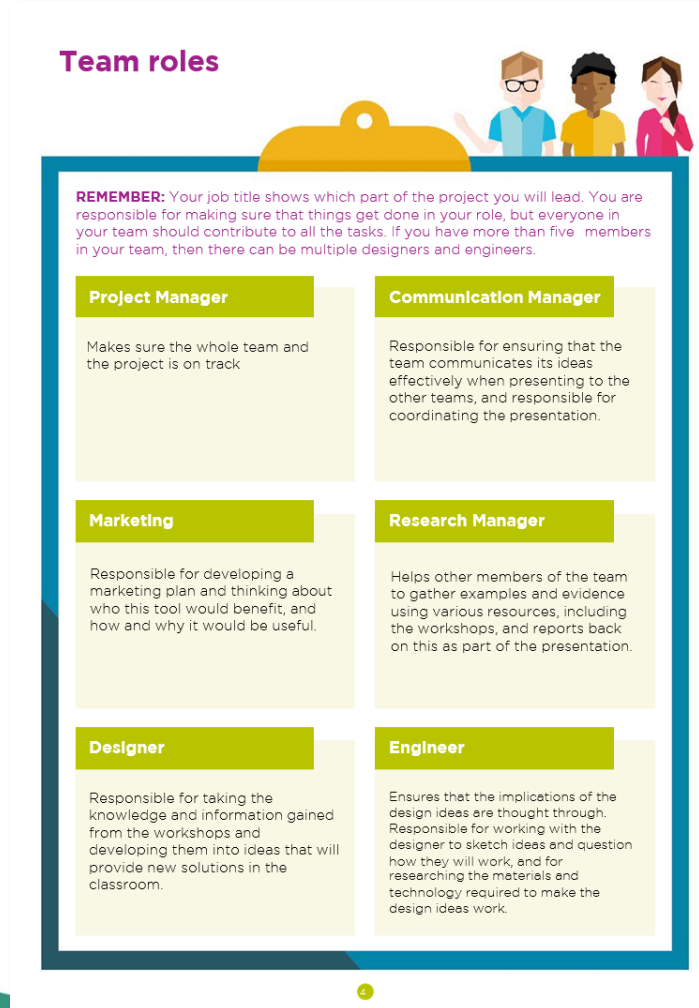
Before restricting sight, hearing or movement, ensure the learners are in a safe space and have appropriate support.
Watch out for any learners showing signs of distress.

Follow your organisation's guidelines for outdoor work.

Make sure any alterations made to sports equipment are safe.

BRITISH SCIENCE ASSOCIATION

New accessible CREST Discovery resources – a preview!



Team roles

REMEMBER: Your job title shows which part of the project you will lead. You are responsible for making sure that things get done in your role, but everyone in your team should contribute to all the tasks. If you have more than five members in your team, then there can be multiple designers and engineers.

Project Manager

Makes sure the whole team and the project is on track

Communication Manager

Responsible for ensuring that the team communicates its ideas effectively when presenting to the other teams, and responsible for coordinating the presentation.

Marketing

Responsible for developing a marketing plan and thinking about who this tool would benefit, and how and why it would be useful.

Research Manager

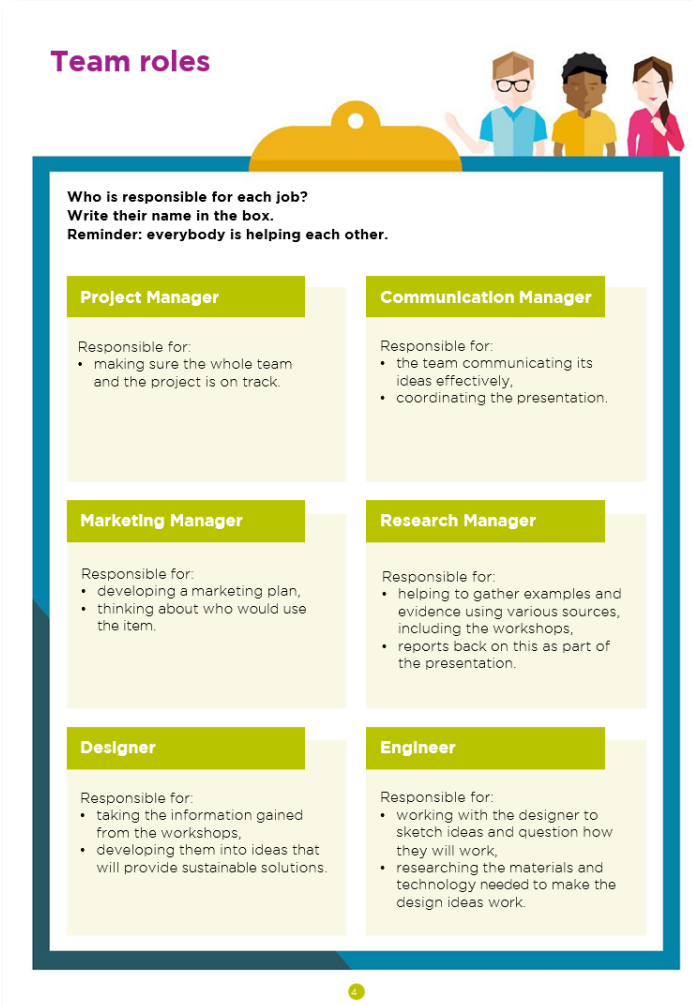
Helps other members of the team to gather examples and evidence using various resources, including the workshops, and reports back on this as part of the presentation.

Designer

Responsible for taking the knowledge and information gained from the workshops and developing them into ideas that will provide new solutions in the classroom.

Engineer

Ensures that the implications of the design ideas are thought through. Responsible for working with the designer to sketch ideas and question how they will work, and for researching the materials and technology required to make the design ideas work.



Team roles

Who is responsible for each job?
Write their name in the box.
Reminder: everybody is helping each other.

Project Manager

Responsible for:
- making sure the whole team and the project is on track.

Communication Manager

Responsible for:
- the team communicating its ideas effectively,
- coordinating the presentation.

Marketing Manager

Responsible for:
- developing a marketing plan,
- thinking about who would use the item.

Research Manager

Responsible for:
- helping to gather examples and evidence using various sources, including the workshops,
- reports back on this as part of the presentation.

Designer

Responsible for:
- taking the information gained from the workshops,
- developing them into ideas that will provide sustainable solutions.

Engineer

Responsible for:
- working with the designer to sketch ideas and question how they will work,
- researching the materials and technology needed to make the design ideas work.

Thank you for joining us!

Any questions?

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King's MA STEM Education programme information page:
https://www.kcl.ac.uk/study/postgraduate-taught/courses/stem-education-ma

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