CREST AWARDS | STAR

Mewburn Ellis
The forward-looking IP firm

On a shoestring collection

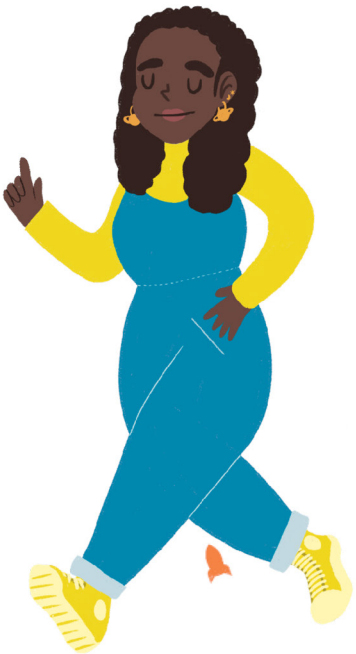
Suitable for
5 to 7-year-olds

This collection of CREST Star activities allows children to explore everyday problems using science. Once they complete at least six challenges, they can receive a CREST Star certificate!

#Investigate #Experiment #Create #Discover

Risk assessment

These hands-on challenges are designed to be interactive and fun for everyone taking part. As with all practical activities, the adult(s) running the investigation should carry out a full risk-assessment beforehand, to ensure that any accidents are avoided. Refer to CLEAPSS for expert advice and guidance, helping to keep you, your children and colleagues safe and ensuring that everyone can enjoy the benefits of hands-on STEM learning (**https://primary.cleapss.org.uk/**).



Start using CREST Star

The activities in this pack have been chosen because they use inexpensive everyday materials. Children need to complete at least six challenges to achieve a Star Award. There is no specific timeline in which you need to run each activity.

Preparation

1. Start by signing up for a CREST account: **apply.crestawards.org**
2. Print the **Star Passport**.
3. Use the Organiser and Activity Cards in this pack to prepare for each challenge.

Run the challenges in this pack

1. Each challenge will take 45 minutes to an hour and involves hands-on investigation, decision making and group discussion.
2. Read the story on the Activity Card with your group and introduce the challenge.
3. Give each group of children a copy of the Activity Card to guide them through the investigation.
4. Children can use their Star Passport to keep track of the challenges they have completed.
5. Once you've completed six activities, log back into your CREST account at: **www.crestawards.org/sign-in**
6. Tell us about the children and the six challenges they completed.
7. Finally, complete the delivery and payment details to order your certificates.
8. Congratulations on completing CREST Star!
9. If you want to use your own activities, that's fine! Find out more about what a Star activity should look like here: **help.crestawards.org/portal/en/kb/articles/can-i-use-my-own-activities-for-the-star-and-superstar-awards**

What next?

Why not challenge children further and try CREST SuperStar next? You can find out more and download all the resources you need here: **primarylibrary.crestawards.org/#SuperStar**

Encourage others to take part in CREST projects. To get more ideas on how to get started visit: **www.crestawards.org**

CREST Star for Mewburn Ellis schools

"We're immensely proud to be working with the BSA. Our vision is to enable more young people to get into science no matter what their background or circumstances. As a firm we now have a strong focus on diversity and inclusion, but key to a really diverse IP industry will be for a broader range of candidates to come into the jobs market. This has to start with schools and providing greater opportunities and we want to invest in making this a reality." – Richard Clegg, Managing Partner of Mewburn Ellis.

The British Science Association (BSA) is delighted to have formed a partnership with Mewburn Ellis, one of Europe's leading intellectual property firms.

Our partnership focuses on enabling and supporting a wider range of schools and students to engage in science. As a national sponsor of the CREST Awards, Mewburn Ellis is proudly supporting the BSA's work to help young people, no matter what their background, get into science.

CREST is a scheme that inspires young people to think and behave like scientists and engineers, reaching those typically underrepresented in science.

In 2021, funding from Mewburn Ellis supported over 1,500 students from schools in its UK office locations (Bristol, Cambridge, London and Manchester) to achieve CREST Awards. This year, we are seeking to deepen our engagement with schools in these four areas.

We will do this firstly through the development of this pack and the accompanying online training sessions for Primary teachers, to help boost teachers' skills and confidence in delivering CREST with their students.

Secondly, we will do this through training several Mewburn Ellis colleagues to support the delivery of CREST Discovery Days, supporting teachers and students on-the-ground and passing on key knowledge and enthusiasm.

Contents

Click the titles to watch the demonstration videos

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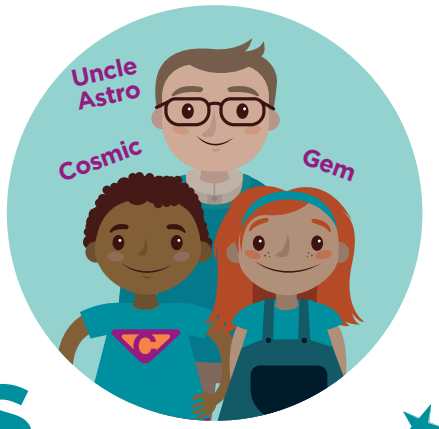


Confusing Cans

Organiser's Card

About the activity

This activity is designed to get children thinking about weights, ramps and investigation.

Gem and Cosmic want baked beans for lunch but Uncle Astro's cans don't have any labels! Gem thinks that they can roll the cans to find out what is inside them.

Through this activity you will support children to:

- Think about how to find out what is inside a can without opening it
- Conduct an experiment to find out what is inside various cans
- Record and present their results

Kit list

- A can of tinned tomatoes, soup, baked beans, cat food for each group, labels removed and marked with different numbers or colours
- A set of cans with labels for comparison
- Boards/trays to make the slopes plus blocks/ books to support it
- Metre rulers, tape measures and other distance markers
- Can opener

What to do

1. Introduce the activity using the story.
2. Give out activity cards and equipment to the children.
3. Explain that they will be exploring how to find out what is inside the tins without opening them.
4. Encourage children to discuss their ideas and how to carry out their investigations. Discuss how they might make the cans roll. Can they make it a fair test e.g. using the same slope or letting go of the cans rather than pushing them from the top etc?
5. Support children to conduct their investigation and make their own records of their results. Let them explore the unlabelled cans first. Then roll the labelled cans to make a comparison. Ask them to use their observations to predict which of their cans contains the beans. Talk about the distance each can rolled and what is inside it. Can they see a pattern? Let the children try rolling other things to see if they fit the pattern. You could open the chosen cans.
6. Ask the children to present their findings to the rest of the group. They can be as creative in their presentation as they want.

Things to think about

Let children decide how to measure the distance each can has rolled. They might make accurate measurements or put down markers to compare distances.

What is inside the can will affect how far it will roll. Normally, the more solid the food, the further the can rolls.

Children might shake the cans to 'listen' to what is inside. The ones that they can 'hear' tend not to roll as far as the ones they cannot hear.

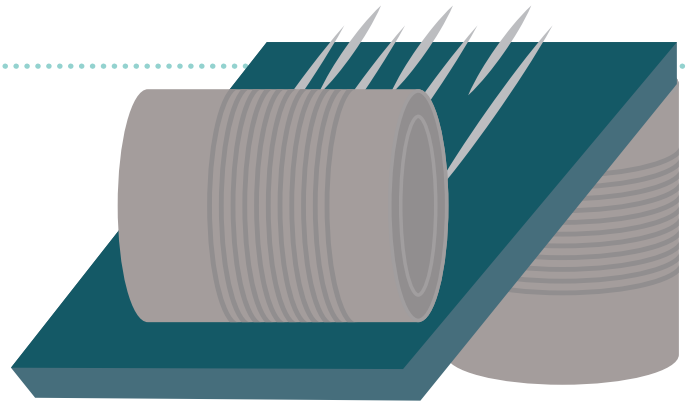
It is useful to have other labelled cans of food available for children to roll to see if they fit the pattern.

They can compare their ideas. You might open some cans. If they have chosen beans they may wish to heat and eat them. If they have chosen cat food, they won't!

Take it futher

You can fill plastic bottles with water, freeze them (without the top) then see if there is a difference in how they roll as the water thaws (don't forget to put the top back on!).

Children can fill containers (large coffee tins or jars with lids are ideal) with different things e.g. sand (different amounts), syrup or cotton wool and see what happens.



Keywords

- Measuring
- Testing
- Distance
- Acceleration
- Weight
- Density
- Volume

Watch out!

Remind children not to leave cans lying on the floor for people to trip over.

Use a safety can opener. Push the can lid well inside open cans and dispose of safely after use. Opening cans and heating food should be done by adults. Check the organisation's policy.

CREST AWARDS | STAR

Confusing Cans

Activity Card

It is lunchtime at Uncle Astro's house. They are going to have beans on toast. It is Cosmic's favourite.

Uncle Astro opens the cupboard doors and suddenly, CRASH, all the cans roll out. Cat food, soup, baked beans, tinned tomatoes all over the floor, and the labels have fallen off. What a disaster!

"How do we know which is the baked bean can?" asks Cosmic. "I don't want cat food or soup on toast!"

Gem picks up one of the cans. It has rolled much further than the others. Cosmic picks up another can. It is still close to the cupboard. "I wonder if the way they roll might help us to work out what is in each can?" says Gem. "Let's see if we can find out."

Your challenge

See if rolling the cans will help Gem and Cosmic to find out what is inside.

Cosmic

I think a can of beans will roll the furthest.

Gem

I think a can of soup will roll the furthest.

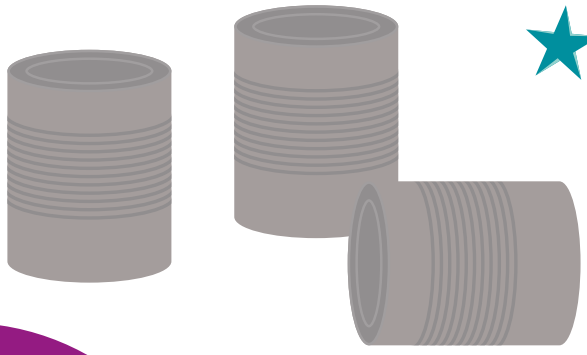
Uncle Astro

I think that what is in side of the can does not make a difference to how it rolls.

Discuss

Have you ever dropped a can and seen it roll?

What happened?



Getting started

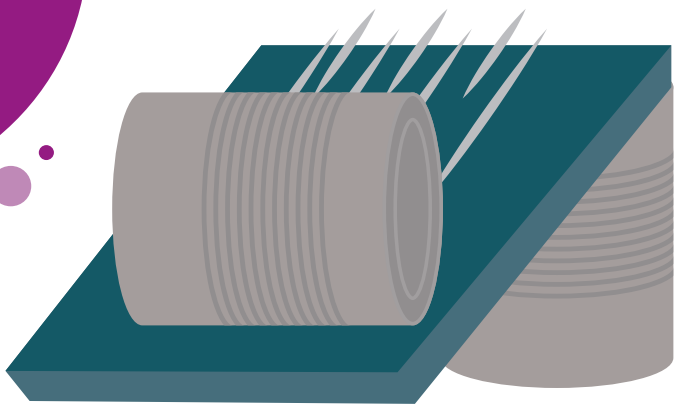
Roll each can down a slope and watch how they roll.

How high will you make the slope?

How will you make sure that you are rolling all the cans in the same way?

How will you know how far they have rolled?

Can you think of other ways to find out?



Test your ideas

You might like to record your results in a table like this one:

	Can 1	Can 2	Can 3
Distance rolled from a 30 cm high slope			
Distance rolled from a 50 cm high slope			
Distance rolled from a 1m high slope			

Share your ideas

Talk about which can might have beans inside it and why. Compare your cans with ones with labels to help you to decide. Open the can and see what's inside!

Extra things to do

Find out what happens if you roll cans or plastic bottles with different things inside. There are lots of things you could use e.g. dry sand, cotton wool, water, plastic beads.

CREST AWARDS | STAR

Rainbow Collectors

Organiser's Card

About the activity

This activity is designed to get children thinking about colours in nature.

Cosmic and Gem see a rainbow at the park, but once the rain stops, the rainbow fades away. Cosmic and Gem are sad that the rainbow has vanished. Aunt Stella thinks that they can make one from the colours that they can see around them.

Through this activity you will support your group to:

- Think about where they might find different colours
- Explore and hunt for different colours in their surroundings
- Gather their results and present them as a beautiful rainbow

Kit list

Colour-collecting palettes – ideally one between two.

Use a long white strip divided up into 6 sections to represent a simple rainbow. Mark each section with a coloured dot (red, orange, yellow, green, blue, purple) or you could let children do this after their discussion. Alternatively you can give each group a plate-sized circle of just one of these colours so that they focus on one colour.

You need to cover the palette with small pieces of double-sided tape. This is where they are going to stick their rainbow samples.

What to do

1. Follow the structure on the activity card. Make sure that you give children time to talk about their ideas.
2. Read the story. Then get the children to talk to a buddy about the questions and the opinions of Cosmic, Gem and Aunt Stella.
3. The children will need a colour-collecting palette (see kit list), ideally one between two.
4. Tell the children about going to look for the rainbow. Make it sound like an exciting adventure.
5. Show them examples of the things to collect e.g. bits of flowers and leaves.
6. Remind them that they must stay near their helper.
7. When they return they can share what they have found and create a rainbow by putting their palettes together. These can then be put on display.
8. There are follow up activities for children who have finished or who want to do more finding out at home and earn a bonus sticker.

Things to think about

This activity helps children to be more aware of colour in their natural environment. Ideally the activity should focus on natural materials, such as plants, but you can choose to let them add other materials to their palette as well.

The activity can take place in any location. It does not need a flower-filled garden or to be out in the countryside.

You may need to encourage children to look carefully to spot the colours.

Children may be tempted to pull up whole plants. It helps to show them how to take a tiny sample and stick it in the right place on the palette.

Take it further

Talk about which colours are easiest to collect, and why. Can they work out what the colours will be like at different times of the year e.g. more red in autumn, yellow in spring?

Keywords

- Plants
- Flowers
- Colour
- Nature

Watch out!

Ensure that you meet your organisation's safety requirements for outdoor activity.

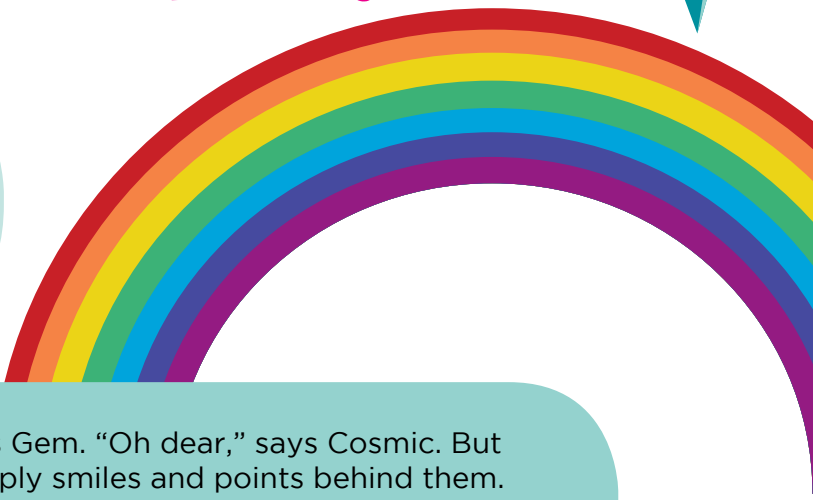
Children must wash their hands thoroughly after this activity. Some organisations may require the children to wear gloves.

Check the area for plants with toxic seeds or plants that might cause irritation.

CREST AWARDS | STAR

Rainbow Collectors

Activity Card



It's a wonderful sunny day. Cosmic and Gem have gone to the park with Aunt Stella. They have had fantastic fun whizzing down the slide. Now they are going on the swings. Splish! Splash! Suddenly, tiny raindrops start to fall.

"Oh dear," says Gem. "Oh dear," says Cosmic. But Aunt Stella simply smiles and points behind them. There across the sky is a rainbow. It is the most beautiful rainbow that they have ever seen.

"Wow!" Cosmic and Gem whisper to each other, afraid that if they speak too loudly the rainbow will go away. But then, as quickly as it had started, the rain stops. Gradually the rainbow fades away. Cosmic and Gem look sad.

"Don't worry," says Aunt Stella. "Look around you. There's green grass and yellow buttercups. The world is full of colours. You can be rainbow colour collectors and make your own rainbow." Perhaps we can help them.

Have you seen a rainbow?
Which colours did you see?
Do you think that Cosmic and Gem can find all the colours of the rainbow?

Your challenge

Can you help Cosmic and Gem find all the colours of the rainbow?

Discuss

Talk to a buddy about your ideas on how to find all the colours of the rainbow.

Getting started

You are going to collect your rainbow on a palette.

Look around you very carefully.

You might find leaves, flowers and other things.

You only need tiny bits of each colour.

Stick the bits of colour on your palette.

Test your ideas

Do you think Cosmic and Gem will find the same colours in spring, summer, autumn and winter?

Share your ideas

Put all your palettes on display to make a beautiful rainbow.

Extra things to do

You could take some photographs or draw pictures of the different colours you can see around you. You could make a rainbow scrapbook.

BRITISH SCIENCE ASSOCIATION

CREST AWARDS | STAR

Organiser's card:

Animal Adventure

About the activity

This activity is designed to get children thinking about minibeasts and habitats. You could run the activity with small groups, or with a whole class.

Cosmic and Seren are bored. Cosmic wants to go on an animal adventure. Uncle Astro said that they will find minibeasts if they look carefully. Cosmic looks high and low but he can't find any little animals. Seren thinks that they should ask Uncle Astro for help.

Through this activity you will support children to:

- Go on a minibeast hunt.
- Find out about the minibeasts they see and their habitats.
- Share their findings with the rest of their group.

What to do

1. Introduce the activity using the story on the accompanying slides or activity card. Ask the children where they think they will find minibeasts.
2. Explain that they will be going on a minibeast hunt.
3. Encourage children to share their ideas about how they will hunt for minibeasts. Prompt questions:
   - Where will we look for minibeasts?
   - Will we collect them?
   - How will we make sure we don't harm them?
4. Give out the equipment to the children.
5. Support children to conduct their investigation and make their own records of their results. They could take photographs or make drawings. Support them to identify what they find – if you have a tablet or mobile phone, you could use Google Lens or a similar app to help with this.

Kit list

- Suitable minibeast collection kit, e.g. pooter, collection jar, collection scissors (special devices for catching minibeasts)
- Appropriate magnifiers, e.g. magnifying glasses
- Identification book or app (optional)
- Outdoor environment, preferably with rocks, logs, large stones, pieces of old carpet (you could place some on the ground a few weeks earlier)

Key words

- **Habitat**
- **Damp**
- **Moist**
- **Minibeast**
- **Skeleton**
- **Invertebrate**

6. Ask the children to share their findings with the rest of the group.
7. Return any collected minibeasts to their habitat.

Things to think about

Teach children to handle all animals with care. It is best to observe minibeasts in their natural environment. However, they can be taken inside for short periods, as long as they are treated with respect and returned to where they were found.

Take it further

Many children believe the word 'animal' refers only to large furry animals and not humans, birds, fish, insects, etc. This hunt focuses on minibeasts but could also include spotting other animals such as birds.

The scientific name for minibeasts is invertebrates, this means an animal without a backbone. Some invertebrates have no skeleton, like worms. Others, like insects and spiders, have a skeleton on the outside (exoskeleton).

You can generally find plenty of minibeasts living in moist, damp, dark environments which help to keep them safe and stop them 'drying out'.

The children could design and make minibeast homes or bug hotels as a follow-up activity. They might like to make up a song or poem about the minibeasts, or create models of them.

Watch out!

- Children should be supervised at all times during this activity – levels of supervision will vary depending on the location and the age of the children.
- All children should be made aware of the boundaries of the minibeast hunting area.
- Children should be reminded not to put their fingers in their mouth, nose or eyes and to wash their hands afterwards.
- Make sure that any stones are not too heavy and are lifted carefully.
- Common outdoor allergens include plants, animals, pollen and stings. Check school records beforehand to see whether any of the children have severe allergies to these.
- Do not bring wild birds or mammals into school as they may carry diseases.
- Follow your organisation's guidelines for outdoor work.
- You can find more guidance on minibeast collection on the CLEAPSS website, in Guide P144

CREST AWARDS | STAR

Activity card:

Animal Adventure

Cosmic and Seren are sitting on the climbing frame in Cosmic's garden. They are trying to think of something to do.

"Let's go on an animal safari!" shouts Cosmic, jumping down.

"Ok," Seren replies, "Do you mean with toy animals?"

"No, not a pretend safari," says Cosmic, "I mean a real animal adventure."

Seren looks puzzled. She follows Cosmic round the garden. He looks high, he looks low but doesn't seem to be able to find what he is looking for.

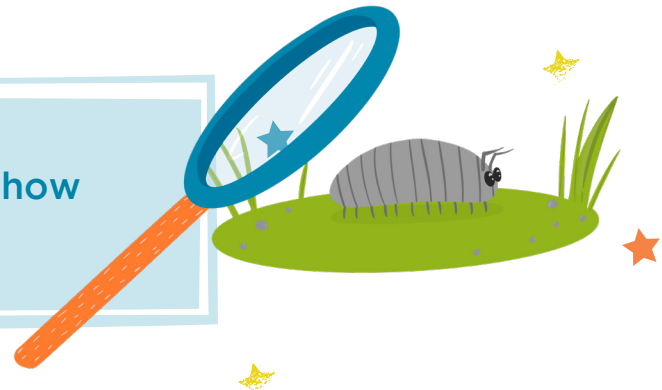
"Uncle Astro said that there are little animals, called minibeasts, all around us," says Cosmic. "But I can't see any."

"Wow! You mean tiny lions and tigers and things?" asks Seren. "Come on, let's see if Uncle Astro can help us."

Where do you think Uncle Astro will tell them to look?

Your challenge

Go on an animal adventure and see how many minibeasts you can find.



Discuss

Cosmic thinks that they might live under logs and stones. Seren thinks we might need to look in trees and on the top of walls.

What do you think?

Getting started

Find a place with a large stone or log. Look carefully all around it to see how many minibeasts you can spot.

Now lift the log or rock very carefully (ask an adult for help) - how many minibeasts can you see? You might collect some of them to look at indoors (check with an adult first).

Test your ideas

Can you find out the names of the minibeasts?

Can you find out more about some of them?

Where is the best place for them to live?

Where do you find the most minibeasts?

Share your ideas

You could take a photo, draw a picture, make up a song or poem, or make a model of the minibeasts you find. Share them with your group.

Extra things to do

Can you think of other places to look for minibeasts?

BRITISH SCIENCE ASSOCIATION

CREST AWARDS | STAR

Organiser's card:

Be Seen, Be Safe

About the activity

This activity is designed to get children thinking about reflection and light. The activity works best when run with small groups.

Tara wants to join Zeke and take Luna the dog out for a walk, but it's starting to get dark. The children are asked to help Tara and Zeke decide on the best thing to wear that will help them be seen in the dark.

Through this activity you will support your group to:

- Test different materials to see how reflective they are.
- Record and share their results.

What to do

1. Introduce the activity using the story on the accompanying slides or activity card. Ask the children what they think will help them to be seen in the dark. Show the equipment to the children.
2. Explain that they will be using the equipment provided to test the best way to be seen in the dark.
3. Encourage children to discuss their ideas about how to carry out their investigations. Prompt questions could include:
   - Which materials do you think will be seen?
   - How will you test to see if the materials are reflective?
   - How will you record your results?
4. Support children to conduct their tests and make their own records of their results. They could sort the materials or order them from least to most effective reflector.
5. Ask the children to share their findings with the rest of the group – they can be as creative in their presentation as they want.

Kit list

You could ask children in advance to bring things in that they think will help them to be seen in the dark.

- A selection of different materials, e.g. different coloured t-shirts or fabrics, reflector armbands, mirrored card, dark/light coloured paper etc.
- Torches
- A place that can be partially blacked out, e.g. use a dark coloured tablecloth over a table to create a dark den.

Things to think about

Some things produce light, e.g. a lamp, the Sun. We call these light sources. Other things can reflect light, but they don't produce light of their own, e.g. a mirror, aluminium foil, a white t-shirt. We call these reflectors. Some colours reflect more light than others. White is easier to see than red; red is easier to see than black.

Reflectors will be seen if there is a source of light. Even on a 'dark' night, there is usually light around, especially in towns. A good reflector may be visible on a dark night because of this. Cat's eyes and reflective strips will also reflect the lights of cars. So Tara and Zeke will need to wear something light coloured or shiny to be safe in the dark.

Key words

- **Light**
- **Dark**
- **Shiny**
- **Safety**
- **Reflection**
- **Source**

Watch out!

Make sure that children are not wandering around in the dark with sharp objects.

Make sure that the area is cleared of obstacles and dangerous substances.

Explain that children should not stare directly at bright light sources.

CREST AWARDS | STAR

Activity card:

Be Seen, Be Safe

Tara is really excited as she's going to meet Zeke's new dog, Luna, and help take her out for a late afternoon walk. Joyti, Tara's grandmother, is coming too, but when she sees Tara putting on her black coat, she shakes her head.

"Hold on," says Joyti, "it's going to start getting dark soon, you can't go out in those clothes, it's not safe!"

"What do you mean?" asks Tara.

"That black coat you're wearing won't be seen once it's dark," explains Joyti. "Let's find you something that will keep you seen and safe!"

Your challenge

Find out if Tara and Zeke can wear something that will help them to be better seen in the dark.

Tara thinks they need to wear something shiny.

Zeke doesn't think what they wear makes a difference.

Joyti thinks they need to wear something white.

What do you think?

Discuss

Why do you think Tara's black coat might not be seen at night?

Have you noticed what you can see in the dark?

How will you find out if different materials can be seen in the dark?

Getting started

You need to compare how well each material can be seen. Make a dark space. You could draw the curtains, work in a tent or cupboard, or use black fabric to make a den. This will help you see the difference between good and bad light reflectors.

Which materials can you see the best?

What difference does having more light make? What can you see in complete darkness?

Do some colours work better than others?

Test your ideas

You could test the different materials and then put them in order from the most difficult to see in the dark, to the easiest to see in the dark. Take a photo and compare your order to other people's. Are they different or the same?

Which material would keep Tara and Zeke the safest as it starts to get dark outside?

Share your ideas

How did your investigation go?

Was there anything you could have improved about your test?

Why not design something for Tara, Zeke or Luna to wear?

Extra things to do

Find out if you can see reflectors in total darkness.

Design a warning poster to help children be safe at night.

BRITISH SCIENCE ASSOCIATION

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Organiser's card:

Plant Detectives

About the activity

This activity is designed to get children thinking about where plants grow. You could run the activity with small groups, or with a whole class.

Zeke has found a plant growing out of the pavement. He can't work out how it got there. Plants grow in gardens, not pavements – don't they? Zeke and Tara need to be plant detectives and look for clues! But where should they look to solve the mystery?

Through this activity you will support your group to:

- Think about where plants grow.
- Investigate and discover plants in their surroundings.
- Record their results using photos, drawings or a map.

What to do

1. Introduce the activity using the story on the accompanying slides or activity card. Get the children to talk to each other about the questions and the opinions of Zeke and Tara.
2. Talk with the children about where they can search for plants. Encourage them to think of unusual places to look.
3. Discuss with the children how they will record their findings and make sure everyone stays safe.
4. Children can collect samples, take photographs or create drawings. If you provide a map or plan of the area, they can add stickers or images to record where plants were found. Confident children may be able to make their own maps or plans.
5. Warn children not to eat any part of the plants that they find.
6. When the children finish hunting, let them share what they have discovered.
7. There are extra things to do on the activity card for children who have finished or who want to do more finding out at home.

Kit list

- Access to a safe outdoor environment, ideally with a variety of surfaces such as brick walls, paving, concrete, grass
- Appropriate magnifiers, e.g. magnifying glasses
- Cameras/tablets, drawing equipment, or stickers and a simple map of your outdoor environment

Key words

- **Grow**
- **Leaves**
- **Flowers**
- **Soil**
- **Plants**
- **Seeds**
- **Samples**
- **Map**

Things to think about

The plants that are found during the hunt will vary depending on the time of year. You can repeat this activity in different seasons and find out how the plants change.

Most children will think that plants need to be planted in soil to grow. They may not be aware that plants (including tree seedlings) can grow in many places where there is little or no soil – for example, between bricks and paving stones, on walls, in gutters, in cracks in the bark of trees and in water. Some plants are adapted to survive in difficult conditions. For example, rosebay willowherb and poppy are plants that grow readily in very sparse conditions.

Take it further

If you have a tablet or a mobile phone, you could try using Google Lens or a similar app to identify the plants that the children find.

During the plant hunt the children may also find lichen and fungi. These are not actually plants, but they are living.

Watch out!

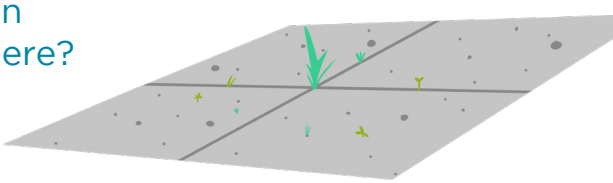
- Follow your organisation's guidelines for outdoor work. Children should be supervised at all times – levels of supervision will vary depending on the location and the age of the children.
- All children should be made aware of the boundaries of the investigation area.
- Common outdoor allergens include plants, animals, pollen and stings. Check school records beforehand to see whether any of the children have severe allergies to these.
- Children should be reminded not to put their fingers in their mouth, nose or eyes.
- Children must not put any plants in their mouths.
- Ensure they wash their hands when they have finished.
- The CLEAPSS website offers more guidance on working safely outdoors, refer to Guide P094 for more information

CREST AWARDS | STAR

Activity card:

Plant Detectives

Zeke is going to play at Tara's house. He's about to open her gate when he notices a plant sticking out of a crack in the pavement. How exciting! Plants usually grow in gardens, not in pavements. How did the plant get there? He thinks that perhaps someone dropped it as they walked along, but who?



Zeke rushes inside to ask Tara to help him solve the mystery. She's bound to know the answer. Zeke explains what he has found, but Tara isn't sure how the plant got there either. She wonders if the plant might have grown from a seed under the pavement, but who could have planted the seed?

Zeke and Tara know they have to look for clues to solve a mystery. They can't wait to start searching. Tara's grandmother, Joyti, loves plants, so she comes outside to help them. But where will they begin? Can you be plant detectives and help to find clues about plants that grow in unusual places?

Where have you seen plants growing?

Have you ever seen any plants growing in a pavement?

Your challenge

Become a plant detective and help Zeke and Tara solve the mystery of where plants grow.

Discuss

Talk to your buddy and plan where you will go on your plant hunt.

Getting started

Have a good look around outside.

Look up and down, in corners, on buildings and patches of land.

Remember, clues about plants might be hidden anywhere!

How can you make sure that everyone stays safe?

Test your ideas

Can you find any plants with flowers?

Can you find any plants growing in strange places?

Do you notice anything about where you find plants growing?

Share your ideas

Take photographs or draw pictures of the plants you find to make a plant detective album. You could mark on a map where you found the plants. What is the strangest place you found a plant growing?

Extra things to do

Try to discover the names of the plants you found.

Try to find out if plants always need soil to grow.

Would you find different plants at different times of year?

BRITISH SCIENCE ASSOCIATION

CREST AWARDS | STAR

Organiser's card:

Sniffly Sneezes

About the activity

This activity is designed to get children thinking about the strength and absorbency of materials. You could run the activity with small groups, or with a whole class.

Achoo!! Zeke has a cold and his hankie isn't working very well. Can you help him find a better one?

Through this activity you will support your group to:

- Think about what makes a good hankie
- Test different materials and observe how they behave when used to absorb water
- Record their results and share them with the group

What to do

1. Introduce the activity using the story on the accompanying slides or activity card. Get the children to talk about the questions and the opinions of Zeke, Tara and Joyti.
2. Then give the children a set of materials to test as hankies. Let them talk about which they think might be best and how they will find out, before they start investigating.
3. You could list the different tests they might want to do e.g. absorbency, strength, smoothness. Make sure that they test all the different materials. Encourage them to use their own ideas too.
4. When they have finished, agree on the winners and talk about why these were the best hankies. You might ask the children to think about why we have disposable tissues.

Kit list

- A selection of different materials that could be used as hankies e.g. cotton fabric, newspaper, crepe paper, cotton wool, tissue paper, greaseproof paper, tissues.
- Plastic trays
- Beakers
- Coloured water (dissolve a drop of food colouring or paint in a beaker of water, this will make the liquid easier for the children to see)
- Pipettes
- Paper towels to clean up any spills

5. To present their work the children could:

   Sort the materials into those that worked well and those that didn't.

   Put the materials in order, from the one that soaked up the most water, to the one that soaked up the least. Take a photo and compare it to other children's results!

   Make a collage, using bits from the different hankies.

   Produce a poster, using smiley faces and sad faces to indicate how good the hankies are.

Things to think about

Encourage children to think of all aspects of what makes a good hankie.

Get them to think carefully about the amount of water used in the absorbency test.

There is no easy way to measure for roughness. The children can estimate how the hankies feel, perhaps using a simple 3-point scale e.g. smooth, rough and in-between.

Take it further

The hankie's absorbency depends on a number of factors, including the thickness of the fibres and size of the spaces between them.

The hankie's strength is important. Cheap tissues can be absorbent, but they may fall apart easily when wet.

How rough the hankie feels is essential, especially when you have a cold. Some tissues have added lubricants, such as Aloe Vera, so that they feel softer. Greaseproof paper feels smooth but is not very absorbent.

Disposable tissues are more hygienic and should be thrown away after they have been used. Germs can multiply quite rapidly in a tissue or hankie that is kept in a warm pocket. If you use it over the course of a day, then it can get pretty unpleasant and unhygienic. This is a good opportunity to remind children to wash their hands regularly if they have a cold.

Key words

- **Wet**
- **Dry**
- **Strong**
- **Weak**
- **Soft**
- **Rough**
- **Germs**
- **Absorbent**
- **Durable**

Watch out!

- Mop up spills to avoid a slippery floor.
- Warn children not to squirt coloured water at each other.
- Test hankies on hands, not noses.
- Remind children not to share hankies.
- Ensure children do not taste or put the liquid or materials used in this activity near their mouths. If you are using food colouring for this activity, it can stain children's hands.

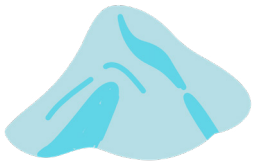
CREST AWARDS | STAR

Activity card:

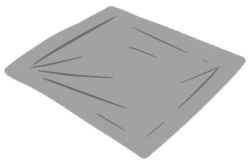
Sniffly Sneezes

Zeke grabs his hankie. Achoo! Achoo! Achoo!

He holds his hankie to his nose and sneezes three more times. “Oh dear, what a horrible sniffly sneeze!” he sighs, tucking his hankie into his pocket.



Now his nose is running! He needs to wipe it quickly. Zeke pulls out his hankie again and rubs his nose. This isn’t any fun.



There’s a knock at the door. It’s Tara. She’s brought Zeke a lolly to cheer him up.

Tara looks at Zeke, “Your nose is all red,” she says. “It must be sore.”

Zeke sighs again. “It’s my hankie. It doesn’t work very well. I wish I had a better one.”

“OK,” says Tara cheerfully. “I’m sure we can find something. I’ll go and ask my grandma, Joyti, to help us. She will have lots of things we could try. But how will we know which is best?”

Joyti says she thinks a hankie needs to be strong when it’s wet. Tara thinks a hankie needs to be soft on your nose, and Zeke thinks it needs to soak up water to keep your nose dry.

Have you ever had a cold? What kind of hankie did you use?

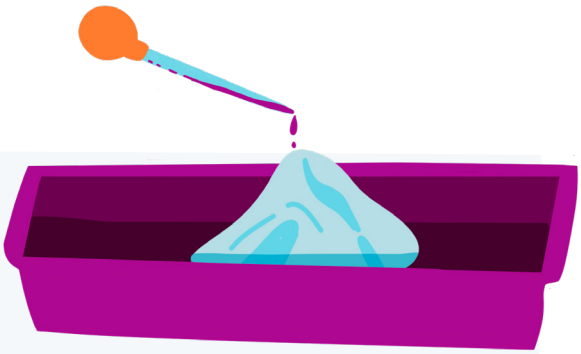
Your challenge

Zeke needs to know which hankie to use. He has lots of things to try. Can you help him?

Discuss

Talk to your buddy about how you will find out which is the best material for a hankie.

Getting started



Get some different materials and a tray.

Collect a beaker of coloured water.

How will you decide which material is best at soaking up the drips of water?

How much water will you put on each material?

Test your ideas

One at a time, put each material in the tray.

Drip coloured water onto the material.

Does it soak up the water?

Will it make a good hankie?

Share your ideas

Sort the materials into ones that worked well and ones that didn't.

Can you put the materials in order from the one that soaks up the least water to the one that soaks up the most?

Take a photo of your order and compare it to other people's.

Which material would make the best hankie?

Extra things to do

Can you do any other tests to decide which hankie is the best?

Find out why it might be better to have a hankie that you can throw away after you have used it.

BRITISH SCIENCE ASSOCIATION

CREST AWARDS | STAR

Organiser's card:

Testing Timers

About the activity

This activity is designed to get children thinking about how sand timers work. You could run the activity with small groups, or with a whole class.

Cosmic, Gem and Seren are practising for sports day. They need a timer to work out how many beanbags they can get into the hoop in one minute, but they are not allowed to throw things in the kitchen near the clock. They want to make a timer to take into the garden. Uncle Astro thinks that they can use sand to make a timer.

Through this activity you will support your group to:

- Compare real sand timers and observe which variables affect the time they measure.
- Experiment with different hole size and quantities of sand in their own sand timer.
- Test their sand timer and reflect on how it could be improved.

Kit list

- Real sand timers
- Dry paper cups
- Dry sand
- Sharp pointed pencil to make holes (use some sticky tack or plasticine underneath the cup to help)
- Stopwatch or clock with second hand (you could use a countdown timer on a tablet or on your whiteboard)
- You might like to use trays or a covering on the tables where the children are working
- Water, sugar, salt etc (optional alternatives to sand)

What to do

1. Introduce the activity by reading the story on the accompanying slides or activity card together. Get the children to talk about the questions and the opinions of Cosmic, Gem and Seren.
2. Discuss how to make sure they carry out the task safely.
3. Let the children look at real sand timers first. Then encourage them to explore different cups and sizes of hole before they try to make their one-minute timer.
4. Talk together about what they have found out. Can they explain why they have different answers to how much sand you need? What would they change to improve their timer?

4. When they have finished they can sort the materials and talk about which ones were waterproof. The children could design an umbrella and evaluate which designs will work and why. They might like to draw a picture of Aunt Stella's umbrella and stick on a piece of the material they would choose to fix it.

5. There are extra things to do on the activity card for children who have finished or who want to do more finding out at home.

Key words

- **Wet**
- **Dry**
- **Materials**
- **Waterproof**
- **Liquids**

Things to think about

There may be more than one property to consider when designing and making objects such as umbrellas, e.g. what it looks like, if the material is flexible, as well as if it is waterproof.

An umbrella needs to be waterproof but a waterproof material that does not fold will not be any use at all. If no-one likes how the umbrella looks, or the material is too heavy, then it will not be used. It is helpful to provide materials such as plastic, foil and wood so that children can explore and discuss their suitability.

Water will sometimes sit on top of some fabrics but when they are touched the water goes through. Thick, soft materials, such as wool and sponge, can get waterlogged even if very little water drips through.

In science, the word material is used to describe the substance from which anything is made. Fabric is one type of material. Metal, plastic and glass are also materials.

Watch out!

- Mop up spills to avoid a slippery floor.
- Warn children not to squirt coloured water at each other.
- Ensure children do not taste or put the liquid or materials used in this activity near their mouths. If using food colouring, this can stain children's fingers.

Take it further

Dripping coloured water onto the material, placed on top of a paper towel, can make it easier to judge how much water has come through. Children can measure the width of the watermark.

You could put the fabric over a container and see how much drips through in a certain amount of time and/or when touched.

CREST AWARDS | STAR

Activity card:

Testing Timers

It will soon be sports day and Cosmic, Gem and Seren are very excited. They have all been chosen to take part in their favourite game. They will have just one minute to throw as many beanbags as they can into a hoop.

“Let’s get practising,” says Cosmic.

“Good idea, we can start straight away,” replies Gem. “I think there’s a hoop and some beanbags in the garden, and we can use the clock on the kitchen wall to time ourselves.”

They are having a wonderful time until Uncle Astro comes into the kitchen to check how his cakes are getting on in the oven. “What are you three getting up to now?” he says with a smile, “Off you go into the garden before something gets broken.”

“But we won’t be able to see the clock from there,” cries Cosmic.

“And then we can’t time one minute to see how many beanbags we get in the hoop,” adds Seren.

“Why don’t you make a timer that you can take outside?” suggests Uncle Astro. “There’s some sand in the shed that might be useful.”

Have you ever seen a sand timer? How do you think a sand timer works?

Cosmic thinks you’ll need a lot of sand to measure one minute.

Gem thinks you only need a little bit of sand.

Seren thinks it might depend on the size of the hole in the timer.

What do you think?

Your challenge

Can you make a timer using sand? Can you make your timer run for exactly one minute?

Discuss

Talk to your buddy about how you can make your timer and how much sand you will need.

Getting started

Make different size holes in the bottom of paper cups with the point of a pencil. Ask an adult to help you with this.

Explore what happens when you put sand in the cups. You can catch the sand in another cup!

How do you think you can stop the sand getting out too soon?

Uncle Astro

Test your ideas

Try each of the cups. What changes how long it takes the sand to come out?

Can you make the sand run for exactly one minute?

Share your ideas

Try out your timer by playing the beanbag and hoop game with your friends.

Draw some pictures or take photographs to show how to make a sand timer.

You could make a short video explaining how a sand timer works.

Extra things to do

Try putting more holes in your timer and see what happens.

What else can you use to make a timer?

Where do you find sand timers? What are they used for?

BRITISH SCIENCE ASSOCIATION

CREST AWARDS | STAR

Organiser's card:

Useless Umbrella

About the activity

This activity is designed to get children thinking about materials and their water resistance. You could run the activity with small groups, or with a whole class.

Aunt Stella is going to a friend's wedding. She is going to take a beautiful, big, rainbow umbrella with her in case it rains. Cosmic has rushed into the garden with the umbrella to try it out. It's raining. Oh no! The umbrella is leaking. Cosmic is getting very wet. How can they fix the umbrella for Aunt Stella?

Through this activity you will support your group to:

- Design an experiment to test how waterproof different materials are.
- Carry out their experiment and observe what happens.
- Decide on the best material for an umbrella and share their ideas.

What to do

1. Introduce the activity by reading the story on the accompanying slides or activity card. Get the children to talk about the questions and the opinions of Cosmic, Seren and Aunt Stella.
2. Provide the children with a selection of different pieces of fabric and other materials to test, some examples are in the kit list.
3. Talk through how they might find out if the fabrics are waterproof. Encourage them to explore their own ideas.

Kit list

- Selection of fabrics and other materials e.g. plastic, sponge, foil, card and wood. Try to make sure some of the fabrics are waterproof. (Pieces from a broken umbrella or raincoat would be good.)
- Pipettes
- Water coloured with food dye or a drop of paint
- Beakers
- Plastic trays
- Paper towels (including a few extra to wipe up any spills)
- Paper, pencils and pens for creating pictures (optional)

5. Children can create pictures or take photographs of their timer. Encourage them to add as much detail as possible including design features and the amount of sand.
6. They can try out each other's timers by playing the 'beanbag and hoop' game.
7. There are extra things to do on the activity card for children who have finished or who want to do more finding out at home.

Things to think about

Some children may not have seen sand timers, so they may need to play with manufactured ones first.

Children can change the type and amount of sand and/or the size of the hole. Let them explore this, with support if they need it.

Making the timers will be easier if children work in pairs or small groups.

Children can use clocks or stopwatches to test their timer. If they find this difficult, let them compare their timer with a manufactured timer.

Take it further

The earliest records of sand timers date from the 14th century and they were often used as timers in factories and on sailing vessels. Sand timers are also known as sandglasses or hourglasses. Today, sand timers are frequently found in kitchens and board games.

It required great skill to create very accurate sand timers with the beautiful hourglass shape and a tiny hole to control the flow of the sand.

Key words

- **Time**
- **Timer**
- **Measuring**
- **Minutes**
- **Seconds**

Watch out!

- Sand on the floor can be very slippery.
- Remind children not to rub their eyes when they are handling the sand and to wash their hands afterwards.
- Adult supervision may be required to make the holes in the cups. Make the hole from the inside of the cup. Use a soft surface underneath the cup, you could use a blob of sticky tack or plasticine.
- If you are using sugar or salt as an alternative to sand, ensure that the children do not taste it or put it in their mouths.

CREST AWARDS | STAR

Activity card:

Useless Umbrella

Aunt Stella is very excited, she has been invited to a friend's wedding.

"Have you got a new dress," Seren asks, "and a new hat?" Aunt Stella goes to her wardrobe and pulls out a rainbow coloured dress and a bright purple hat.

"You are going to look fantastic," says Cosmic. "Do you have an umbrella too, in case it rains?" Aunt Stella nods and goes to the cupboard and pulls out a huge, rainbow coloured umbrella to match her dress. "Here it is," she says.

"It's enormous! Can we try it Aunt Stella?" shouts Cosmic, as he rushes outside to open the umbrella.

But it's raining outside and no sooner has Cosmic opened the umbrella than drip, drip, drip, rain is tumbling onto his head through the umbrella. The umbrella is full of holes! The umbrella is useless. "What am I going to do?" says Aunt Stella. "I don't have another one."

"Don't worry Aunt Stella, I am sure we can fix it for you," says Cosmic.

"We just need to find something waterproof," suggests Seren.

Cosmic and Seren need to find something to fix Aunt Stella's umbrella.

Cosmic thinks they need a sponge to make it waterproof

Seren thinks they need thick fabric to fix the umbrella

Aunt Stella thinks they need brightly coloured, thin fabric to fix the umbrella.

What do you think?

Your challenge

Think about what umbrellas are made from and how they stop you getting wet.

Can you find the best material to fix Aunt Stella's umbrella?

Discuss

Talk to your buddy about which material you think will be the best for an umbrella. How do you think you can find out?

Getting started

Collect some different materials and a beaker of coloured water.

You will also need a plastic tray and some dry paper towels.

Which materials do you think will let the water through?

Test your ideas

One at a time, put each material on a paper towel, on the plastic tray.

Put one drop of coloured water on each material. Does any water come through onto the paper towel?

Can you think of any other ways to find out which materials are waterproof?

Share your ideas

You could use a hoop to sort the materials into ones that are waterproof and ones that are not. Would all the waterproof materials be good for fixing the umbrella? Why?

Draw Aunt Stella's umbrella and stick pieces of the best materials on the picture. Do you think Aunt Stella will like the umbrella?

Extra things to do

Make a list of things that you might want to protect from the rain.

What about a rabbit in the garden, your books on the way to the library or shopping on the way home? Can you think of ways to keep them dry?

BONUS STICKERS HERE

Signed _ _ _ _ _ _ _ _ _ _ _ _

Date _ _ _ _ _ _ _ _ _ _ _ _

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CREST AWARDS | STAR

PASSPORT

Name _ _ _ _ _ _ _ _ _ _ _ _

_ _ _ _ _ _ _ _ _ _ _ _

Collect stickers or stamps for your passport after completing each activity!

Start

your journey here

1

2

3

Nearly there!

4

5

Great job!

6

Having fun? Take it further!

7

8

Well done

you have completed your CREST Star Award!

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