



STAR

Mewburn  
The forward-looking  
IP firm Ellis

# 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 these eight challenges, they can receive a CREST Star certificate and badge!

#Investigate #Experiment #Create #Discover

# Start using CREST Star

The activities in this pack have been chosen because they use inexpensive everyday materials. Children need to complete all eight 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](https://apply.crestawards.org)
2. Print the **Star Passport**.
3. Use the Organiser 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.
  - Children can use their Star Passport to keep track of the challenges they have completed.
5. Once you've completed all eight activities, log back into your CREST account at: [www.crestawards.org/sign-in](https://www.crestawards.org/sign-in)
6. Tell us about the children and the eight challenges they completed.
7. Finally, complete the delivery and payment details to order your certificates and badges.
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](https://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](https://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](https://www.crestawards.org)





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# STAR



# Animal Adventure

## Organiser's Card



### About the activity

This activity is designed to get children thinking about minibeasts and habitats.

Cosmic and Gem are bored. Gem wants to go on an animal adventure. Uncle Astro said that they will find minibeasts if they look carefully. Gem looks high and low but she can't find any little animals. Cosmic thinks 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 the group



### Kit list

- Collecting jar or pooter (special devices for catching minibeasts)
- Magnifying glasses and/or digital microscope
- Identification book (optional)
- Outdoor environment, preferably with rocks, logs, large stones, pieces of old carpet (you could place some on the ground a few weeks earlier)

### What to do

1. Introduce the activity using the story on the activity card. Ask the children where they think they will find minibeasts.
2. Give out activity cards and equipment to the children.
3. Explain that they will be going on a minibeast hunt.
4. Encourage children to discuss their ideas and how to carry out their investigations. Prompt questions:
  - Where will you look for minibeasts?
  - Will we collect them? How will we make sure we don't harm them?
5. Support children to conduct their investigation and make their own records of their results. They could also take photographs or make drawings. They might like to use a minibeast guide to identify what they find.
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.
7. Return any collected minibeasts to their habitat.

# Things to talk about

Teach the children to handle all animals with care. It is best to observe animals 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

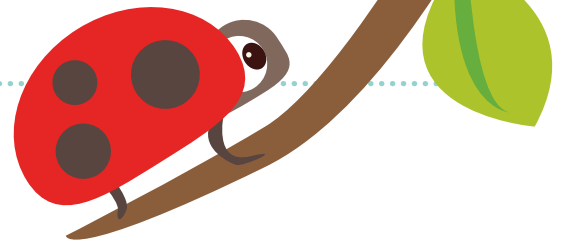
Many children believe the word 'animal' refers only to large furry animals and not humans, fish, birds, insects, etc. This hunt focuses on minibeasts but could also include other animals such as birds.

The term 'minibeast' means a small animal. 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'.

## Keywords

- Habitat
- Minibeast
- Invertebrate



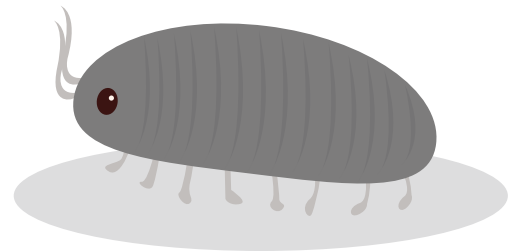
## Watch out!

Make sure that children wash their hands carefully after handling creatures.

Follow the organisation's guidelines for outdoor work.

Make sure that stones are not too heavy and are lifted carefully.

Do not bring wild birds or mammals into school as they may carry diseases.





STAR

# Animal Adventure

## Activity Card

Cosmic and Gem are sitting on the climbing frame. They are bored.

“Let’s go on an animal safari!” shouts Gem, jumping down.

“OK,” Cosmic replies. He starts to prowl around Gem while pretending to be a tiger.

“No, not a pretend safari,” says Gem, “I mean a real animal adventure.” Cosmic looks puzzled. He follows Gem round the playground. She looks high, she looks low but doesn’t seem to be able to find what she is looking for.

“Uncle Astro said that there are little animals, called minibeasts, all around us,” says Gem. “But I can’t see any.”

“Wow! You mean tiny lions and tigers and things?” asks Cosmic. “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 animals you can find.



GEM

COSMIC

## Discuss



Gem thinks that they might live underneath logs and stones. Cosmic 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 animals you can spot.

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

## Test your ideas

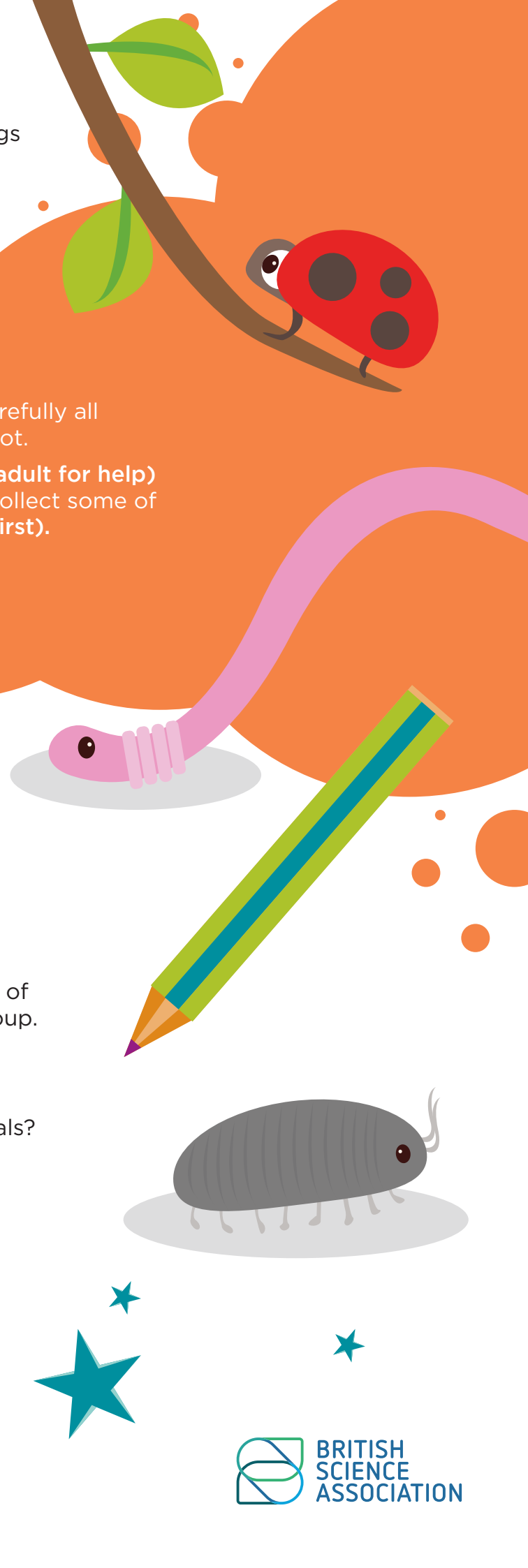
Can you find out the names of the animals?  
Find out more about some of the animals.  
Where is the best place for them to live?

## Share your ideas

Draw a picture, write a poem or make a model of the animals you find. Share them with your group.

## Extra things to do

Can you think of other places to look for animals?





# STAR

# Be Seen Be Safe

## Organiser's Card



## About the activity

This activity is designed to get children thinking about reflection and light.

Gem has a new bike! Children are asked to help Cosmic and Gem to find out if they can wear something that will help them be seen in the dark.

Through this activity you will support children to:

- Test different materials to see how reflective they are
- Test to see if other variables make a difference to reflectivity
- Record their results and share them with the group.

## Kit list

You can use whatever is available at home.

- A selection of different materials e.g. different coloured T-shirts or fabrics, reflector armbands, foil, shiny paper, black paper, dark/light coloured objects
- Torches
- A place that you can partially blackout

## What to do

1. Introduce the activity using the story of Cosmic and Gem. Ask the children what they think will help them to be seen in the dark. Give out activity cards and 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 and how to carry out their investigations. Prompt questions:
  - What materials will they test?
  - How will they test to see if they are reflective?
  - How will they make sure their test is fair?
  - How will they record their results?
4. Support children to conduct their tests and make their own records of their results.
5. 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

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 Cosmic and Gem will need to wear something light coloured or shiny to be safe in the dark. They also need to get lights on their bikes.

## Keywords

- Reflection
- Source
- Light
- Safety

## 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





# STAR

# Be Seen Be Safe

## Activity Card

It is a great day for Gem. Her new bike has arrived. She is going for a ride with Cosmic to visit Aunt Stella. She puts on her favourite black tracksuit and pedals off to meet Cosmic.

A little later, Aunt Stella is SO worried. It's gone as dark as night outside. Where are they?

Suddenly there's a loud knock, rat-a-tat-tat, on the door.

Oh no! It's a policeman with Gem and Cosmic. They are looking very sheepish.

"I nearly knocked these two off their bikes," grumbles the policeman. "They were riding round, no lights and just look at what they are wearing! No wonder I couldn't see them."

"Oh dear!" says Aunt Stella. "We need to make sure you can be seen and be safe in the dark. Now I wonder what we could do? I think we may need some help."



## Your challenge

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

Cosmic thinks they need to wear something shiny

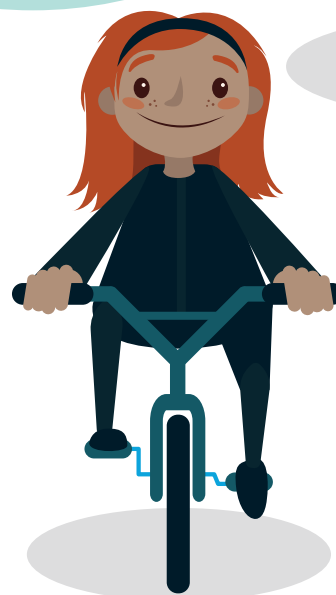
Gem doesn't think what we wear makes a difference

Aunt Stella thinks they need to wear something white

**What do you think?**

## Discuss

- Why do you think Gem and Cosmic couldn't be seen?
- Was it just because they didn't have lights on their bikes?
- Have you noticed what you can see in the dark?
- How will you find out if different materials can be seen in the dark?
- What will you do to make sure it is a fair test?



# Getting started

You need to compare how well each material can be seen. Make a dark space by drawing curtains, working in a corridor or other dimly lit area, to 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

Make a table to record your results.

Material	How well does it reflect?		
	Complete darkness	A little bit of light	A lot of light
Shiny material			
White material			
Dark material			

## Share your ideas

How did your investigation go?

Was there anything you could have improved about your test?

Why not design something for Cosmic and Gem to wear?

## Extra things to do

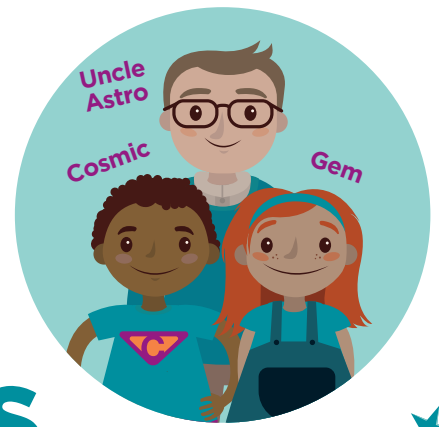
Find out if you can see reflectors in total darkness.

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





# STAR



# 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!

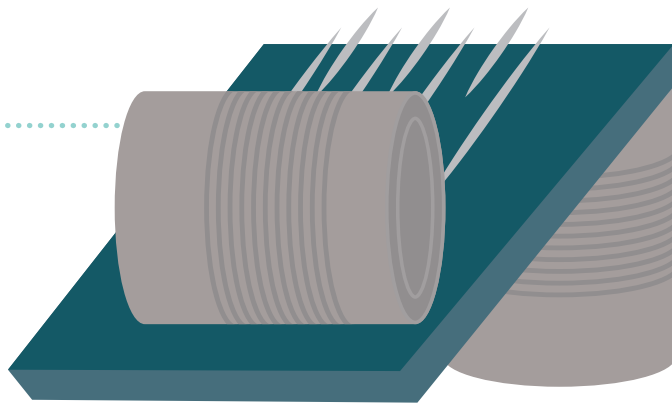
## Take it futher

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.



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.

**Gem**



I think a can of beans will roll the furthest.

I think a can of soup will roll the furthest.

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

**Cosmic**



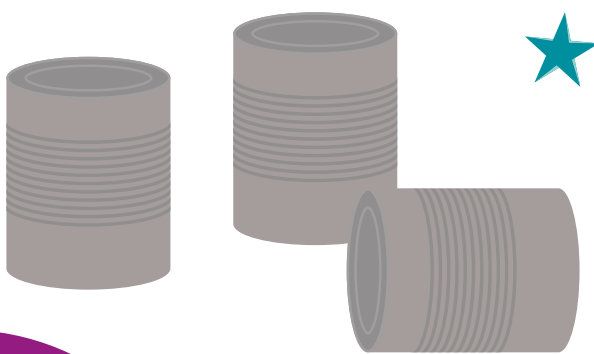
**Uncle Astro**



## Discuss

Have you ever dropped a can and seen it roll?

What happened?



## Getting started

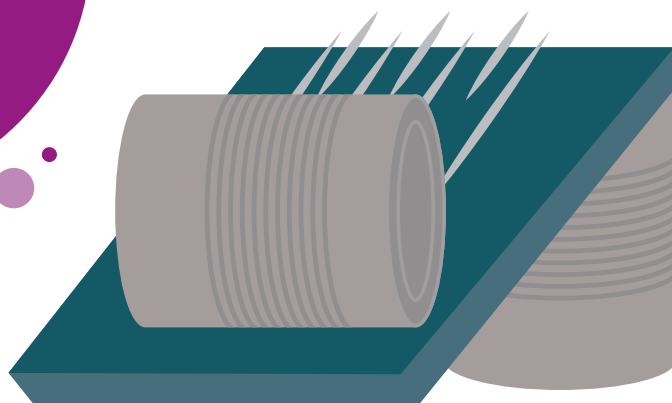
Roll each can down a slope and watch how they roll.

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.



# STAR

# Plant Detectives

## Organiser's Card



## About the activity

This activity is designed to get children thinking about where plants grow.

Cosmic 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? Cosmic and Gem 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 and how they get there
- Investigate and discover plants in their surroundings
- Record their results and present them in an album or poster

## Kit list

- Access to a safe outdoor environment, ideally with a variety of surfaces such as brick walls, paving, concrete, grass
- Magnifying glass or digital microscope (optional)
- Identification guide
- Camera(s) or drawing equipment

## What to do

1. Follow the instructions on the ACTIVITY CARD. Make sure you give the children time to talk about their ideas.
2. Read the story. Get the children to talk to each other about the questions and the opinions of Aunt Stella, Cosmic and Gem.
3. Talk with the children about where they can search for plants. Encourage them to think of unusual places to look.
4. Discuss with the children how they will record their findings and make sure everyone stays safe.
5. Children can collect samples, take photographs or create drawings. If you provide a map or plan of the area, they can add stickers or their images to record where plants were found. Confident children may be able to make their own maps or plans
6. Warn children not to eat any part of the plants that they find.
7. Encourage children to think how the plants they find have got there.
8. When the children finish hunting let them share their clues about what they have discovered.
9. Can they decide how the plants got to their locations?.
10. 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

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.

Plants get to these locations in various ways, including wind dispersal and being carried by birds or other animals. Some may spread from other areas by plants growing sideways stems (stolons and rhizomes).

## Take it further

During the plant hunt the children may also find mosses, lichen and fungi. All of these are classified separately from the common plants (such as trees, flowers and grasses); lichens and fungi are not actually plants.

## Keywords

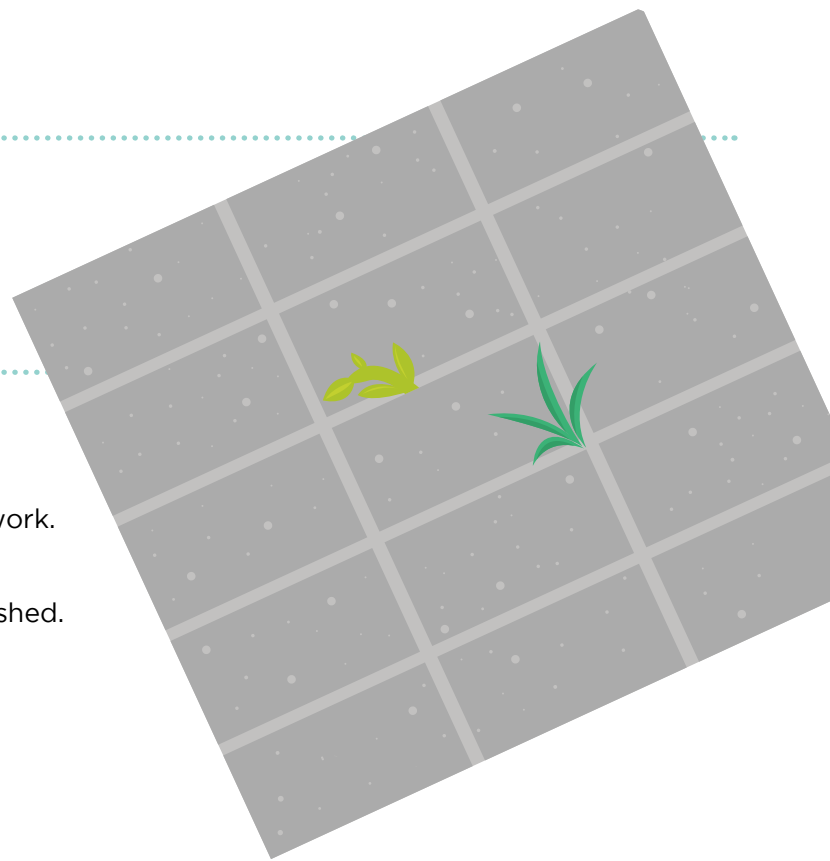
- Plants
- Seeds
- Sampling
- Nature

## Watch out!

Follow the organisation's guidelines for outdoor work.

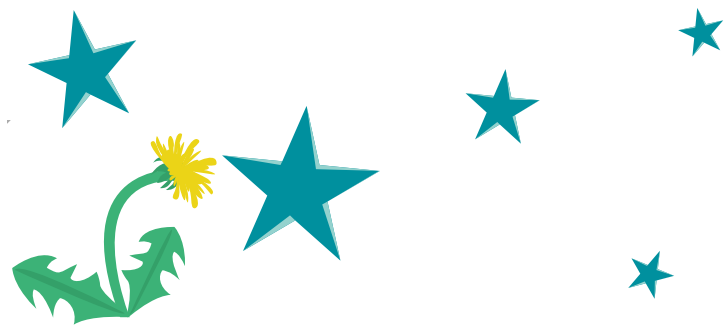
Children must not put any plants in their mouths.

Ensure they wash their hands when they have finished.





STAR



# Plant Detectives

## Activity Card

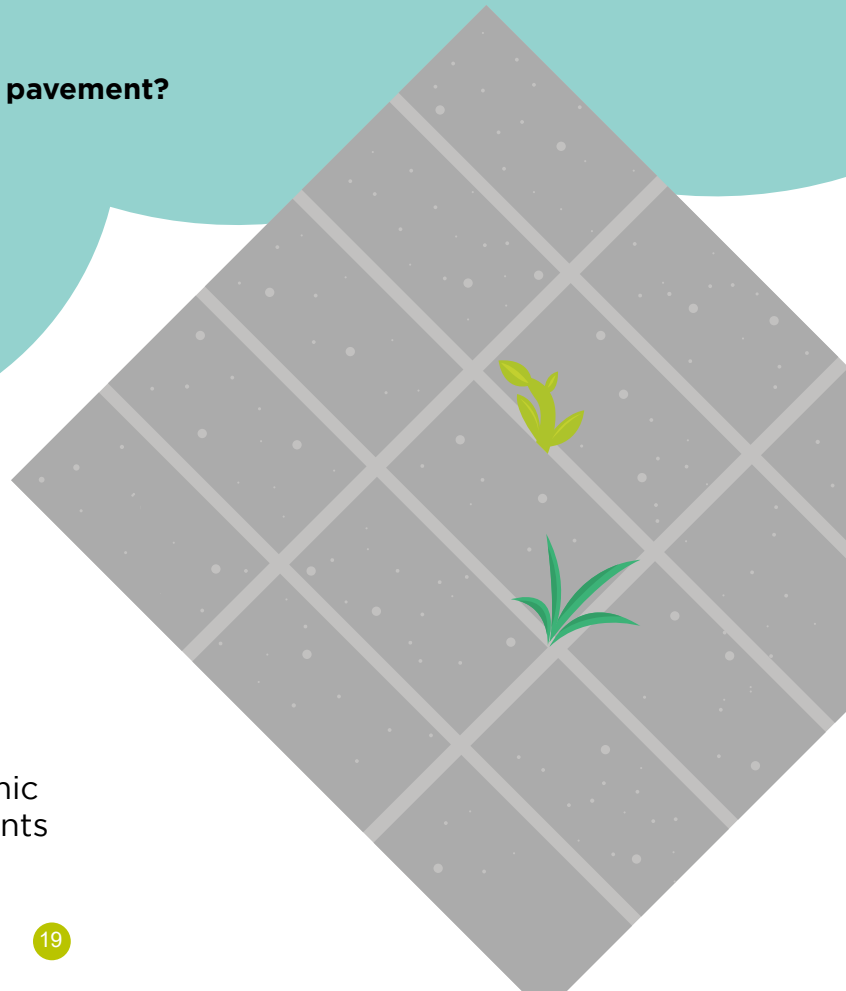


Cosmic is walking along the street to meet Gem at the shops. On the way he notices a plant sticking out of a crack in the pavement. How exciting! Plants usually grow in gardens, not in pavements. How did the plant get there? He thinks that perhaps someone dropped it as they walked along, but who?

Cosmic runs to ask Gem to help him solve the mystery. She's bound to know the answer. Cosmic explains what he has found, but Gem 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?

Cosmic and Gem know they have to look for clues to solve a mystery. They can't wait to start searching. Aunt Stella loves plants, so she comes 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 Cosmic and Gem 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!

Can you find any plants with flowers?

Where is the strangest place you can find a plant growing?

Do you notice anything about where you find plants growing?

How can you make sure that everyone stays safe?

## Test your ideas

If you find any plants, can you work out how they got there?

## Share your ideas

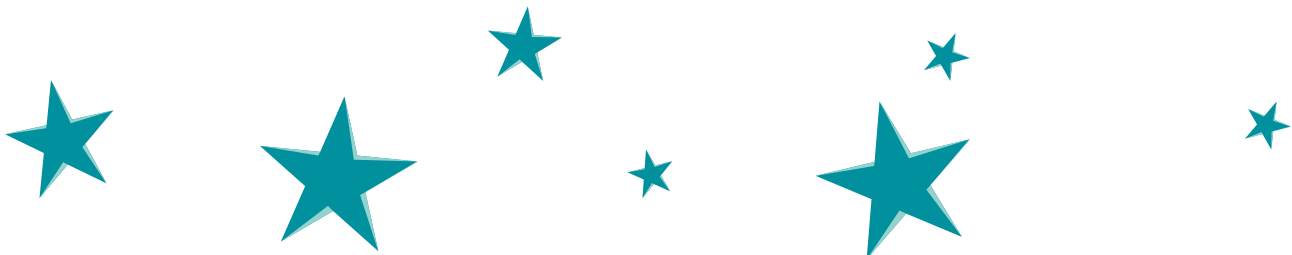
Take photographs or draw pictures of the plants you find to make a plant detective album. Mark on a map where you found the plants.

## 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?





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. See website for advice -

[www.britishtscienceassociation.org/creststar](http://www.britishtscienceassociation.org/creststar)





# 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. Suddenly splish, splash, 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." I wonder if they can? 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.





# STAR

# Sniffly Sneezes

## Organiser's Card



## About the activity

This activity is designed to get children thinking about the strength and absorbency of materials.

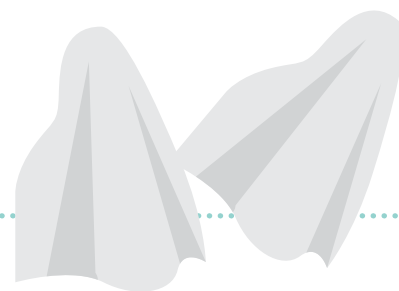
Achoo!! Gem has a cold and her hankie isn't working very well. Can you help her find a better one?

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.

## Kit list

- A selection of different materials that could be used as hankies e.g. tissue paper, cotton, newspaper, crepe paper, cotton wool, paper (different makes), tissues, greaseproof paper
- Plastic trays
- Water and food colourings
- Plastic pipettes
- Podium sheets – see [www.britishscienceassociation.org/creststar](http://www.britishscienceassociation.org/creststar)



## 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. Get the children to talk to a buddy about the questions and the opinions of Gem, Cosmic and Aunt Stella.
3. 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
4. You could list the different tests they might want to do e.g. absorbency, strength or smoothness. Make sure that they test all the different materials. Encourage them to use their own ideas too.
5. When they have finished, put the best materials on the winners' podium and talk about why these were the best hankies. You might get them to think why we have disposable tissues.
6. 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.

To present their work the children could:

Draw or place the hankies on the winners' podium.

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. You may need to cut up cotton hankies to get sensible sized pieces, so buy cheap ones from a market or make your own from a large piece of cloth.

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. Germs can multiply quite rapidly in a hankie that is kept in a warm pocket. If you use a hankie over the course of a day then it can get pretty unpleasant and unhygienic. However, disposable tissues might be wasteful. This is a good opportunity to remind children to wash their hands regularly if they have a cold.



## Keywords

- Germs
- Absorbency
- Strength
- Durability



## Watch out!

Test hankies on hands, not noses.

Remind children not to share hankies.





STAR

# Sniffly Sneezes

Activity Card

## Gem grabs her hankie. Achoo! Achoo! Achoo!

She holds her hankie to her nose and sneezes three more times. "Oh dear, what a horrible sniffly sneeze!" she sighs, tucking her hankie into her pocket. Now her nose is running! She needs to wipe it quickly. Gem pulls out her hankie again and rubs her nose. This isn't any fun.

There's a knock at the door. It's Cosmic. He's brought Gem a lolly to cheer her up.

Cosmic looks at Gem, "Your nose is all red," he says. "You look like a clown!" Gem sighs again. "It's my hankie. It doesn't work very well. I wish I had a better one."

"OK," says Cosmic cheerfully. "I'm sure we can find something. Let's ask Aunt Stella to help us. She will have lots of things we could try. But how will we know which is best?"

Aunt Stella says she thinks a hankie needs to be strong when it's wet. Cosmic thinks a hankie needs to be soft on your nose, and Gem 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



Gem needs to know which hankie to use. She has lots of things to try. Can you help her?



# 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.

Put a piece of material in a tray.

Drip coloured water onto the material.

Does it soak up the water?

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

How will you make sure that everything is fair?

## Test your ideas

Can you think of other ways to find out?

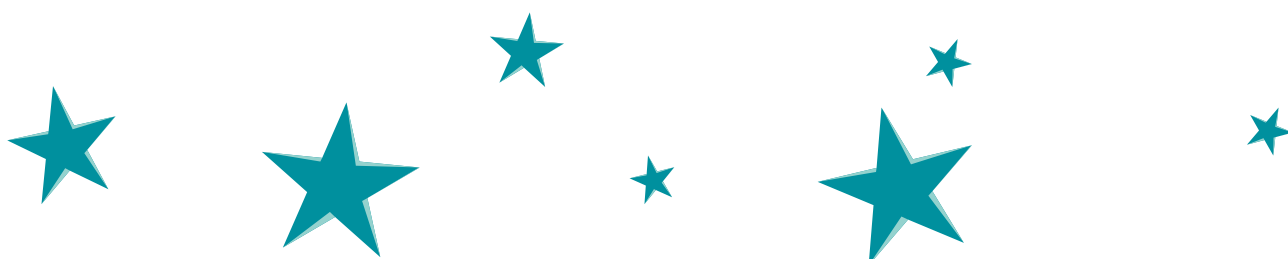
## Share your ideas

Put the best hankie on the winners' podium.

## 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.





# SUPERSTAR

## Testing Timers Organiser's Card



### About the activity

This activity is designed to get children thinking about how sand timers work.

Cosmic and Gem are practising for sports day. They need a timer to work out how many balls they can get into the bucket in one minute, but they are not allowed to throw balls 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 what variables effect 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

- Sand timers
- Dry paper cups (washed used ones will be fine)
- Dry sand
- Covering for tables
- Sharp pointed pencil to make holes
- Stopwatch or clock with second hand
- Water, sugar, salt etc (optional)

### What to do

1. Introduce the activity by reading the story on the activity card together. Get the children to talk to a buddy about the questions and the opinions of Cosmic, Gem and Uncle Astro.
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?
5. Children can create labelled pictures or photographs of their timer. Encourage them to add as much detail as possible including design features and the amount of sand.
6. 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. They can try out each other's timers by playing the 'ball and bucket' game.

# Things to think about

Some children may not have seen sand timers, so they 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 without your support.

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

Children can use clocks 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.

## Keywords

- Time
- Measuring

## Watch out!

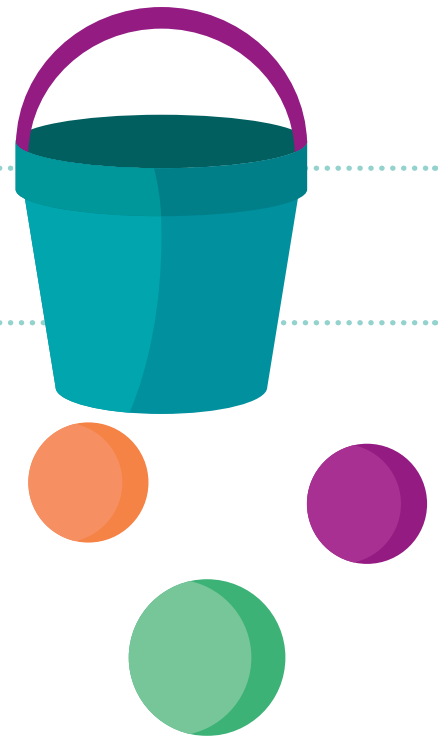
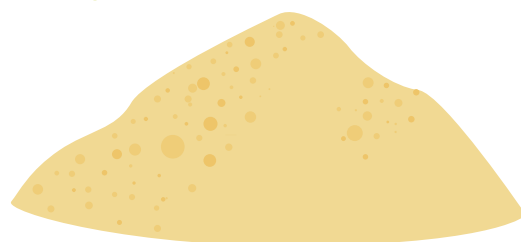
Sand on the floor can be very slippery.

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.

## Find out more (links to further info)

Egg timers normally run for three minutes. One minute timers are available via school suppliers see [www.britishscienceassociation.org/creststar](http://www.britishscienceassociation.org/creststar)



## Testing Timers

### Activity Card

It will soon be sports day and Cosmic and Gem are very excited. They have both been chosen to take part in the 'ball in the bucket' event. It's their favourite game. They will have just one minute to throw as many balls as they can into a bucket.

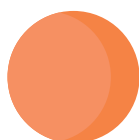
"Let's get practising," says Cosmic.

"Good idea, we can start straight away," replies Gem. "I think there's a bucket and some tennis balls in Uncle Astro's shed, and we can use the clock on the kitchen wall to time ourselves."

They were 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 two 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 balls we get in the bucket," adds Gem.

"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."



## Your challenge

Cosmic and Gem want to make a timer to take into the garden.

Have you ever seen a sand timer?

How do you think a sand timer works?

Uncle Astro thinks you'll need a lot of sand to measure one minute

Gem thinks you only need a little bit of sand

Cosmic thinks it might depend on the size of the hole in the timer

### What do you think?

Make a sand timer that will run for one minute every time you use it.



## Discuss

Talk to your buddy about what you think might have happened.

## Getting started

Make different size holes in the bottom of paper cups with the point of a pencil. (Safety – ask an adult for help).

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?

Choose one of the cups. See if you can make the sand run for exactly one minute.

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

How much sand takes one minute? Is it the same for each cup?

## Test your ideas

Can you think of other ways to make a sand timer?

## Share your ideas

Try out your timer by playing the 'ball and bucket' game with your friends.

Draw some pictures or take photographs to show how to make a sand timer. Show how you can improve your timer.

## 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?



# SUPERSTAR



# Useless Umbrella

## Organiser's Card



### About the activity

This activity is designed to get children thinking about materials and their water resistance.

Aunt Stella is going to a party at Buckingham Palace. She is going to take a beautiful, big, rainbow umbrella with her in case it rains. Gem has rushed into the garden with the umbrella to try it out. It's raining. Oh no! The umbrella is leaking. Gem 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.



## 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)
- Droppers or pipettes
- Water coloured with food dye

- Beakers or jars
- Paper towels
- Picture-making materials, podium sheets, Useless umbrella sheets.

See website - [www.britishecienceassociation.org/creststar](http://www.britishecienceassociation.org/creststar)

## What to do

1. Read the story on the Activity Card. Get the children to talk to a buddy about the ideas in the questions and the opinions of Cosmic, Gem 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 and think about fair testing e.g. use the same amount of water, use the same size pieces of fabric, leave the water on the fabric for the same amount of time, decide when and whether to touch the fabrics.
4. When they have finished they can put the best materials on the winners' podium and talk about why these were waterproof. The children could design an umbrella and evaluate which designs will work and why. They can make a picture showing Cosmic and Gem under an umbrella made out of the most appropriate materials. They could also put the materials on the winners' podium?
5. 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

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.

## 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.



## Keywords

- Materials
- Waterproof
- Liquids.

## Watch out!

Mop up spills to avoid slippery floor.

Warn children not to squirt coloured water at each other.





# Useless Umbrella

## Activity Card

Aunt Stella is in a tizzy. She has been invited to a party at Buckingham Palace. "Wow!" say Cosmic and Gem. "You must be very important."

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

"You're going to look fantastic," says Gem. "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 Gem, as she rushes outside to open the umbrella.

But it's raining outside and no sooner has Gem opened the umbrella than drip, drip, drip, rain is tumbling on her 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 Gem. "We just need to find something waterproof."



## Your challenge

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

What are umbrellas made from?

How do they stop you getting wet?

Gem thinks they need a sponge to make it waterproof

Cosmic 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?

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.

Put each one on top of a different piece of paper towel.

Put one drop of coloured water onto each piece.

How much water goes through?

How can you make sure the test is fair?

## Test your ideas

Can you think of any other ways to find out?

## Share your ideas

Draw Aunt Stella's umbrella and stick pieces of the best materials on the picture. Do you think Aunt Stella will like the umbrella? Why do you think that? Is there anything you think you should change?

## Extra things to do

Make a list of other things you might want to keep dry.

Here are some ideas to get you started – a rabbit in the garden, your books on the way to the library and shopping on the way home from the shops.

Design ways of keeping them dry.





**STAR**

**BONUS  
STICKERS  
HERE**



**PASSPORT**

**Signed** \_\_\_\_\_

**Date** \_\_\_\_\_

**Name** \_\_\_\_\_  
\_\_\_\_\_



Collect stickers for your passport after completing each activity!

**Start**  
your journey here

1

Great job!

4

5

Only two more to go!

7

Nearly there!

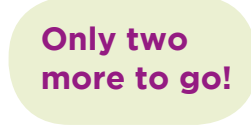
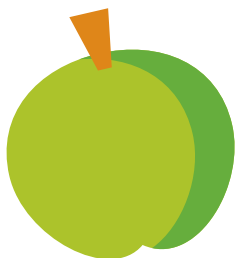
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**Well done**  
you have completed your CREST Star Award!

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