

# Science Challenge



## Bouncing Balls Investigation



What makes a ball bounce? Is it what the ball is made of? Is it the air inside the ball? Does it matter what the ball bounces off of?

To investigate bouncing a ball on different surfaces you will need a ball that can usually bounce. It doesn't matter if it is a big ball like a football a smaller ball like a tennis ball or a tiny one like a marble or a golf ball.

By dropping the ball, investigate how well it bounces on different surfaces like hard floors, tiles or wood, grass, carpet and soft surfaces.

Try putting a cushion or pillow where the ball will bounce. Does this make a difference?

Then try putting a hard-backed book or a tin cooking tray. Does this make a difference?

How could you measure this? Could you make a measuring chart with a piece of paper stuck to a door or wall with blu tac? Mark the height you are going to drop the ball from with a line then watch carefully and mark the height the ball bounces to on the paper.

Try out all of the different surfaces. What did you find out? Does the ball bounce better on a hard or soft surface? Does it make a difference what height you drop the ball from?

# Technology Challenge



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## Raw or Boiled Egg

Surprise your friends and family with an easy experiment that answers an otherwise tricky question. Two eggs look and feel the same but there is a big difference, one is raw and the other hard boiled, find out which is which with this fun experiment.

### **What you'll need:**

- Two eggs, one hard boiled and one raw. *Ask an adult to help you hard boil the egg and then make sure the hard boiled egg has been in the fridge long enough to be the same temperature as the raw egg.*

### **Instructions:** *Do not break the eggs.*

1. Spin the eggs and watch what happens; one egg should spin while the other wobbles.
2. You can also lightly touch each of the eggs while they are spinning, one should stop quickly while the other keeps moving after you have touched it.



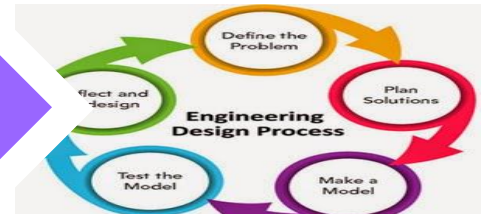
### **What's happening?**

The raw egg's centre of gravity changes as the white and yolk move around inside the shell, causing the wobbling motion. Even after you touch the shell it continues moving. This is because of **inertia**, the same type of force you feel when you change direction or stop suddenly in a car, your body wants to move one way while the car wants to do something different.

The solid white and yolk of the hard boiled egg has less inertia and therefore responds much quicker if you touch it.

This is a good experiment to test a friend or someone in your family with, see if they can figure out how to tell the difference between the eggs (without smashing them of course) before showing them your nifty trick.

# Engineering Challenge



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## Terrific Trampolining!

**Challenge:** Can you create a trampoline out of a colander and make tweaks to your design to improve the height you get a small toy to bounce?



**You will need:** a colander, toothpicks, rubber bands, scissors, material to make the mat, a toy to bounce (or a ping pong ball works well), measuring tape and blu-tak.

**Research:** Watch [this short clip](#) which shows some of the science(physics) of trampolining.

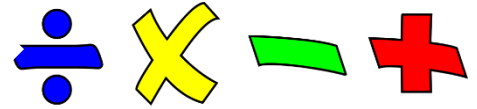
**Planning:** How many holes of the colander will you use? Which height will you use them from? How many rubber bands will you use? How many toothpicks will you need? Draw a labelled plan of your trampoline model, showing where you have used the materials and how many of them you will need.

**Make:** Construct your model trampoline. Use the tooth picks on the outside of the colander to hold the elastic band in place- they should be stretched across the inside of the colander with the ends out through the holes and secured by the toothpicks.

**Test:** Place your trampoline on the floor beside a wall or door and measure height markers – you could mark these with blu-tak blobs or blu-tak the measuring tape to the wall. Then test out how well your toy bounces. Think about factors you will need to keep the same to make sure it is a fair test. Will you just test it once or a few times? Why?

**Improve:** Look at your design and results, what changes could you make? Make changes to your design and retest it again, recording your results. Did you manage to improve your toy's bounce? Why do you think you got this result?

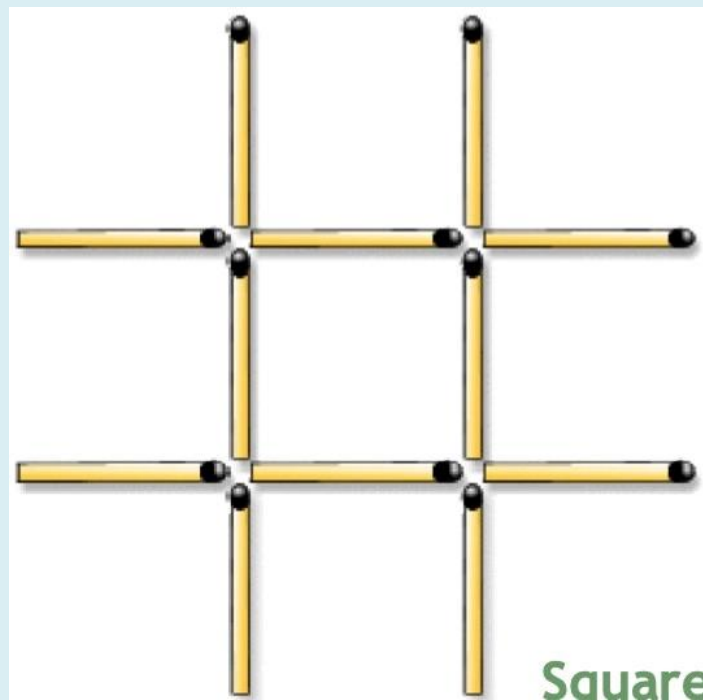
# Maths & Numeracy Challenge



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## Matchstick Challenge

Make this arrangement with used matchsticks. *If you don't have matchsticks then you can use pencils, straws or something similar.*



Can you move three matches to make three perfect squares?

You are not allowed to overlap the matches or have any loose ends.

Picture from [woodcraft.co.uk](http://woodcraft.co.uk)

# Literacy Challenge



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## Poem

### Missing: DAISY

Anyone seen my DRAGON?  
Scary, Scaly  
Tall 'n Taily  
Daisy the Dreadful Dragon.

She's got bad breath.  
A temper true.  
Eats old ladies. (Children too.)

She breathes out fire.  
She puffs out smoke.  
She'll singe your hair. She'll make  
you choke.

Anyone seen my DRAGON?  
Scary, Scaly  
Tall 'n Taily  
Daisy the Dreadful Dragon

She soars about.  
She seeks out food.  
Makes loud noises. (Mainly rude.)

Yes, she's grumpy.  
Yes, she's smelly.  
Big Butt always blocks the telly.

Anyone seen my DRAGON?  
Scary, Scaly  
Tall 'n Taily  
Daisy the Dreadful Dragon

And she's beastly.  
And a pest.  
But I love her. (She's the best.)

Please send Daisy  
Back to me.  
Treat her well. Or you'll be tea

Anyone seen my dragon

By James Carter

This Poem about a lost dragon has lots of rhyming words, read it through or ask an adult to read it to you and listen for the rhymes. Can you hear them? There is a part of the poem called the chorus. This is repeated a few times. It goes **Anyone seen my DRAGON? Scary, Scaly, Tall 'n Taily, Daisy the Dreadful Dragon**

Try to find an interesting way to read that such as starting very quietly and building up the volume as you get nearer to the end.

Now think about how you could write your own poem like this one. Maybe it could be about a pet or a toy that is missing. To make up your chorus you will need to decide what has been lost, maybe a cat, and think about what it looks like.

Anyone seen my CAT?  
Soft and fluffy...

Once you have created your chorus go back to the poem about the dragon and see if you can use that to help you create the rest of your poem about what your pet likes to do.



# Health & Wellbeing Challenge

## An Attitude of Gratitude

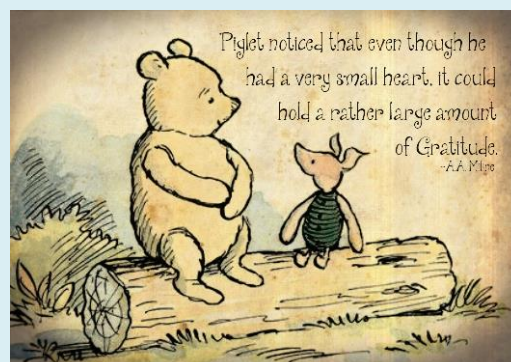


Have you ever heard of the word gratitude before? **Gratitude is about focusing on what's good in our lives and being thankful for the things we have**, no matter how small or big they might seem. **Listen and learn [this catchy song](#)** about being thankful by The Juicebox Jukebox.

### Gratitude scavenger hunt

Go on a gratitude scavenger hunt, to help you think about all the things you can be thankful for and the good around you. You could collect the things you find, take photos of them or write them down.

1. Find something outside you enjoy looking at.
2. Find something that is useful to you.
3. Find something that is your favourite colour.
4. Find something which will make someone else happy.
5. Find something which tastes good!
6. Find something that makes you happy.
7. Find something that makes you laugh.
8. Find something that makes you feel safe.
9. Find something that smells amazing.
10. Find your favourite place to spend alone time.
11. Find something that reminds you of the people you love.
12. Find something which is unique to you.
13. Discover something new.
14. Find something that you enjoy doing outside with friends.





# Social Studies Challenge



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## Night At The Museum

A museum is “a building in which objects of historical, scientific, artistic, or cultural interest are stored and exhibited.”

(<https://www.lexico.com/en/definition/museum>)

Can you create a museum exhibit or artefact for a period in history that interests you and that you have some knowledge on?

For example, you could make a Viking shield or axe, you may want to make a model of a World War 2 Anderson Shelter or you may decide to make your museum exhibit by creating an Egyptian mummy or pyramid. Or you could make a museum to display important things in your life?



It is important for visitors to the museum to be able to find out information about the exhibits they see.

Once you've created your exhibit, can you produce some information to go along with it so that others can find out about your interesting item from history?

# Expressive Arts Challenge



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## Pop Art

Pop Art uses very bright colours and bold pictures. Here are some examples



Here is a short video about creating a Pop Art word

[Pop Art Example](#)

To make your own piece of Pop Art try this:

- First divide your paper into four parts by folding it in half then in half again. Choose a simple image like a piece of fruit- a banana or a strawberry.
- Draw it in the first section of your paper. Colour it in using very bold colours and thick black lines.
- Make another copy of the same object in the next section but use different colours for the object and background.
- Repeat until you have 4 copies like this.

Remember to outline your work with a thick black line.