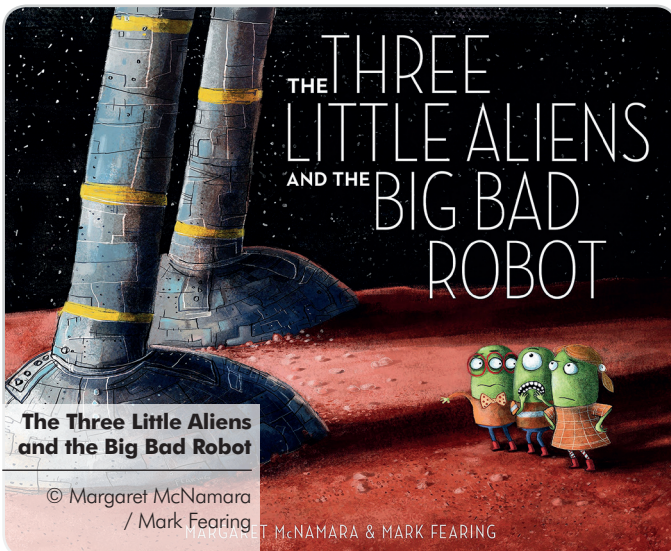


## For 5 to 7 year olds

## Context

If humans are to live on Mars one day, to survive its harsh conditions they will need shelter to protect themselves from radiation and the lack of atmospheric pressure; they will also need a supply of water, oxygen, food and energy. The European Space Agency has plans to build a village on the Moon to be a stopover for robotic missions to Mars; NASA has plans to 3D print houses on Mars! In this activity, the children enjoy a story, a retelling of the classic Three Little Pigs; they build a variety of model houses from straws, sticks and plasticine, identify the 2D and 3D shapes produced, and describe their properties.



## National curriculum links

## Maths - shape, space and measure:

- Recognise and name common 2D and 3D shapes
- Identify and describe the properties of 3D shapes including the number of edges, vertices and faces
- Identify 2D shapes on the surface of 3D shapes
- Draw 2D shapes and make 3D shapes from modelling materials

## Resources

- Activity sheets 1, 1a
- 2D and 3D shapes for demonstration
- Straws
- Pipe cleaners or wooden ice lolly sticks
- Plasticine or playdough
- Individual whiteboards

## Lesson starter

Read the story 'The Three Little Aliens and the Big Bad Robot' by Margaret McNamara, a retelling of the traditional Three Little Pigs. Set the scene by first playing the short trailer for the book:

[www.youtube.com/watch?v=mox6tur7s80](http://www.youtube.com/watch?v=mox6tur7s80)

In this tale, three little aliens travel to other planets on the Solar system to escape the big bad robot intent on destroying their homes with his swinging arms, ripping claws and triple blaster!

- Do the children recognise any similarities between this and a well known story?
- Can they recall the names of any planets visited by the little aliens?

Explain that scientists are hoping in the future to send astronauts on a long journey to Mars. Mars is very cold and often very windy. The astronauts will need houses to live in. The houses will need to be strong. Can they think why? Today we are going to build some model houses of different shapes to see which is strongest.

### Main activity

What 2D shapes can the children think of? Hold up each 2D shape and ask the children to point to a 3D shape with a similar face. Discuss the faces, vertices and edges. Provide straws of two different lengths, and pipe cleaners cut into sections to act as joints. (See support notes.) Show the children how to join lengths of straws together using the sections of pipe cleaners. Explain that they are going to use the straws and pipe cleaners to try to build 3D shapes shown on Activity sheet 1. Alternatively, ice lolly sticks can be used instead of straws and joined together with plasticine or playdough. The children could investigate building with both sets of materials and compare. Individual white boards or plasticine boards act as stable bases for the models. Allow time for the children to make changes and improvements to their models.

### Plenary

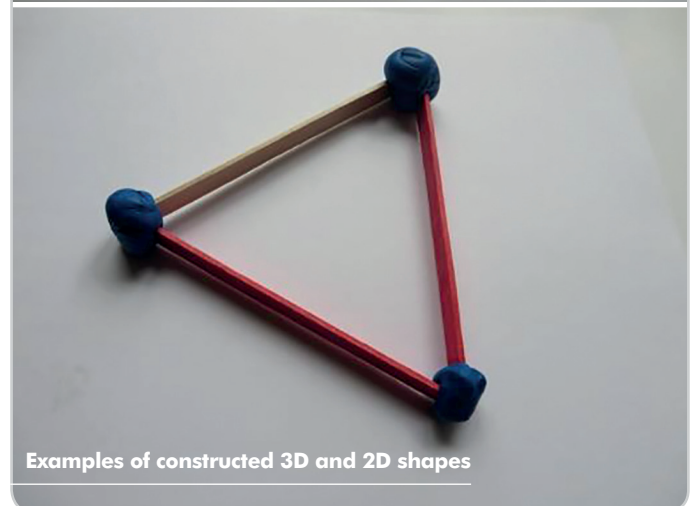
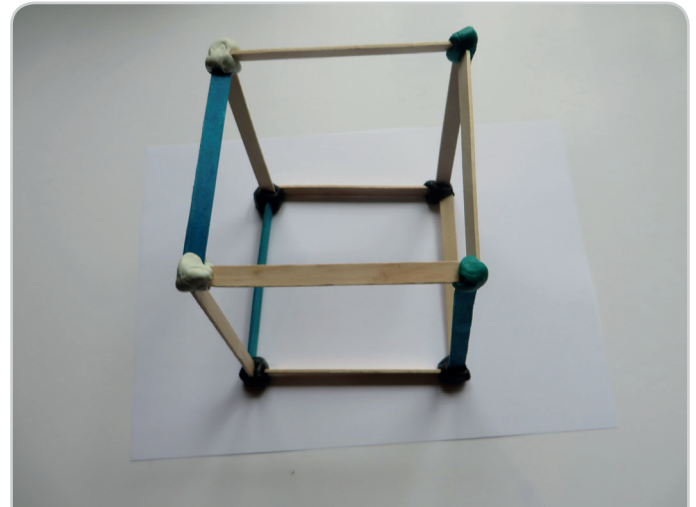
The children show their model 3D shapes. Reinforce the names and properties. Which were easiest or most difficult to make? Are they strong or wobbly? How could we find out? Can they suggest any tests we could do? Explain that ESA is sending a rocket and a rover called Rosalind to Mars. Before the launch, the equipment gets shaken to test how strong it is and checked for damage. Show the image of the test: [www.esa.int/Our\\_Activities/Space\\_Science/Shaking\\_ExoMars%20](http://www.esa.int/Our_Activities/Space_Science/Shaking_ExoMars%20)

Which of the models would they recommend for using to design houses on Mars? Why?

Finish the lesson with a poem 'Spaceship Shop' or 'A Saucer of Creatures from Mars' on Activity sheet 1a.

### Further activities

- Design another method for testing how strong the model 3D shapes are.
- Could you design a whole town for Mars. What features would it have?
- Can you think of other materials to use to build a model Martian home? Explain your choices.
- Examples of constructed 3D and 2D shapes



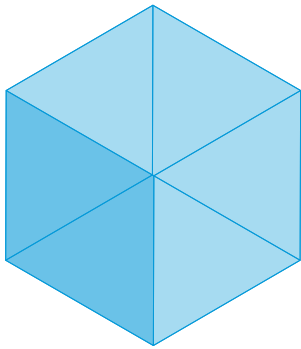
Examples of constructed 3D and 2D shapes

### STEM Vocabulary

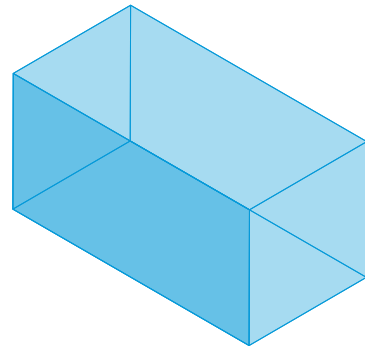
Square	Cube	Square pyramid
Triangle	Cuboid	Face, edge, vertex, vertices
Rectangle	Triangular Prism	

Can you build houses using some of these shapes?

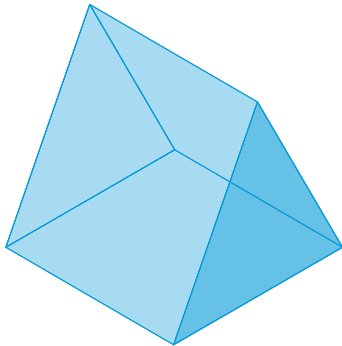
### Cube



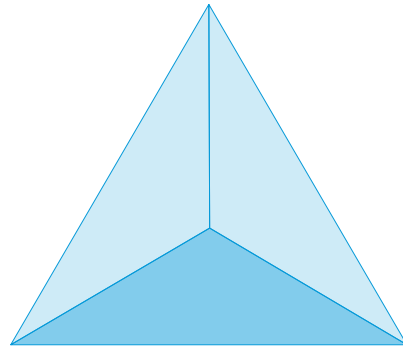
### Cuboid



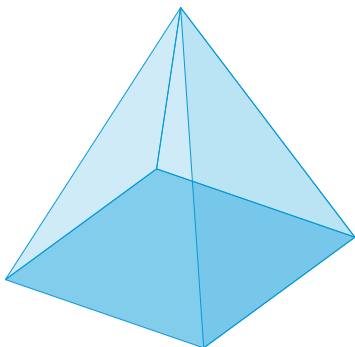
### Triangular prism



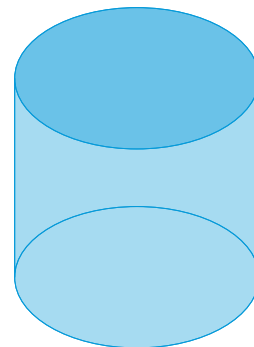
### Triangular pyramid



### Square pyramid



### Cylinder



**'A Saucer of Creatures From Mars' by Philip Waddell**



A saucer of creatures from Mars  
Set off on a night filled with stars  
They left at a streak  
But were back in the week  
For they missed their mamas and papas

**'Spaceship Shop' by Bernard Young**

I need to find a spaceship shop  
I want to buy a rocket  
One that's sleek and shiny  
With a key so I can lock it  
My aim is to travel  
As high as I can go  
Then land on a peaceful planet  
Leap out and say "Hello!"  
I won't stay in space too long  
With bright stars all around me  
I know if I'm not home on time  
Mum is bound to ground me  
But first I need to find that space shop  
So I can find a rocket  
One that's sleek and shiny  
With a key so I can lock it  
Note: Make sure that its brakes work  
I'll crash if I can't stop it!

