

EngineersWeek

8-13 February, 2010

ACTIVITY SHEET

MATHS-TRONOMY

What is astronomy?

Astronomy is the science which studies everything outside of the Earth's atmosphere. Astronomers explore planets, the Sun, stars, asteroids and much more so you can learn more about life outside Earth.

Fun Facts



- On 3rd November 1957, a Russian dog named Laika became the first living creature to orbit the Earth in a Soviet spacecraft named Sputnik 2.



- More than 1 million Earths could fit inside the Sun. By far, the Sun is the largest object in our solar system.



- The International Space Station orbits the Earth at a speed of 28,000km/hr. At this speed it only takes the space station 1.5 hours to travel around the Earth once.



- A car traveling at 100 mph would take more than 29 million years to reach the nearest star



- Apollo 11 was the first manned mission to land on the Moon. It took 3 days, 3 hours and 49 minutes to reach the Moon.

Astronauts

Astronauts are the people who work on spacecrafts and space stations in order to carry out research and explore space!

Many astronauts live and work on the International Space Station. This Space Station travels around the Earth, 400 km above our heads. It is circling so fast that it does not fall down to Earth.



Did You Know:

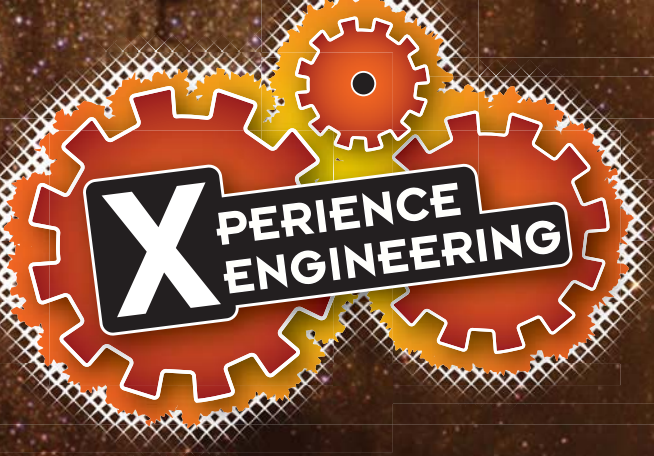
If you could run very, very fast you would be able to orbit the Earth too. But you would have to reach a speed of 8 km per second – a hundred times faster than a race car!

Eating in space is quite tricky for astronauts. Astronauts eat from plastic bags with a spoon, and drink from squeeze bottles with a straw. If they are not careful, bits of food and blobs of water will float around the space station.

Astronauts are only allowed take a few personal belongings on their missions into space. Some take a book or a CD. Others might take a camera or a gift from a close friend.

Discussion:

What would you take with you to space if you were only allowed take 3 items? Why?



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Weight and gravity

Gravity is the force that pulls us towards the Earth. It is this force that holds us to the ground and allows us to walk around. In space there is no gravity pulling things down and so everything becomes weightless and floats around.

Did you know:

If you weighed yourself on 4 different planets you would be a different weight on each one. This is because each planet in our solar system has a different gravitational pull.

Example: If your weight on Earth is 40kg; and if the gravitational pull on the Moon is .16 of the same force on earth, your weight on the moon would be $0.16 \times 40\text{kg} = 6.4\text{kg}$!

Now use your multiplication skills to calculate your weight on these four planets below.

Your Weight on Earth (kg)	Gravitational Pull	Your weight on..	Planet
x	.38	=	Mercury
x	.91	=	Venus
x	.16	=	Moon
x	.38	=	Mars

Try this in class:

Measure your height first thing in the morning with the help of one of your classmates. Do the same at the end of the day. Is there any difference in your height? Why do you think this is?



Discussion:

Do you know the feeling of being weightless?

What are your hobbies? Would these hobbies be possible in space?



Speed of light and light years

The fastest thing in the universe is light which travels at a speed of 0.3 million kilometres per second. To get an idea of how fast this is, light can travel about seven times around the earth in one second. Use your maths division skills to calculate how long it takes light from the Sun to reach the planets below.

Planet	Speed that light travels every second	Distance from the Sun	No. of seconds it takes light to reach planet from Sun
Mercury	0.3 million km	58 million km	
Venus	0.3 million km	108 million km	
Mars	0.3 million km	228 million km	
Jupiter	0.3 million km	778 million km	

What is a light year?

Astronomers use the speed of light to measure how far away things are in space. They use a unit called the light year. A light year is the distance light can travel in one year.

1 light year = 9,460,000,000,000 Km.

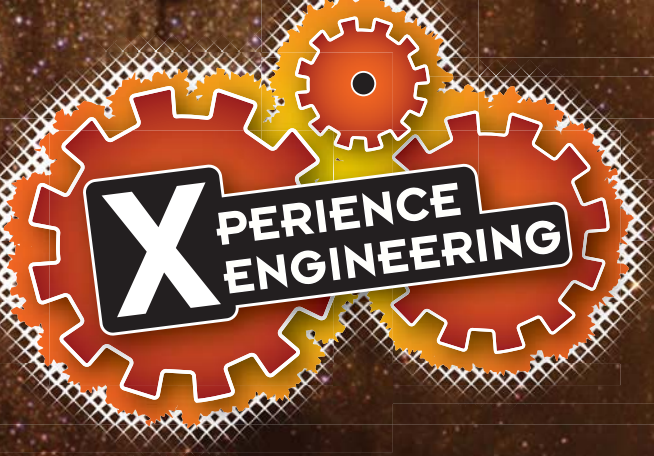


Did You Know:

The nearest star to us on Earth, Proxima Centauri, is 4.2 light years away.

Use your maths problem-solving skills to work out how many kilometres a beam of light would travel in:

4 years	
8 years	

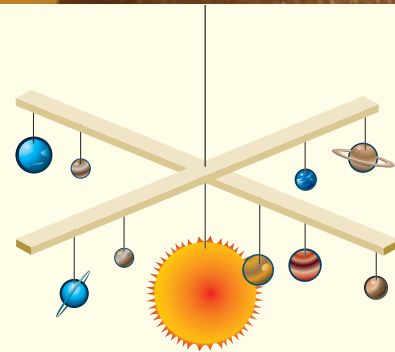


MAKE AND DO: THE SOLAR SYSTEM

You need:

Ruler, compass or other tools to draw the shapes

- Coloured pencils
- Coloured cardboard
- Glue
- Scissors
- 2 sticks
- Thread
- Needle



Make your solar system

1. Decide which tools (ruler, pair of compasses etc.) you can use to draw the lines of your figures. Use these tools to draw the shapes for your figures on the cardboard.
2. Cut out the figures.

Put the mobile together

1. Put two sticks together in the middle to form a cross and tie them together with thread.
2. Make a hole at the top end of each of your figures. Use a needle to pull the thread through.
3. Label and hang your planets in the correct order from the sticks.
4. Tie another thread in the middle of the cross so that you can hang it up in the classroom or at home.

