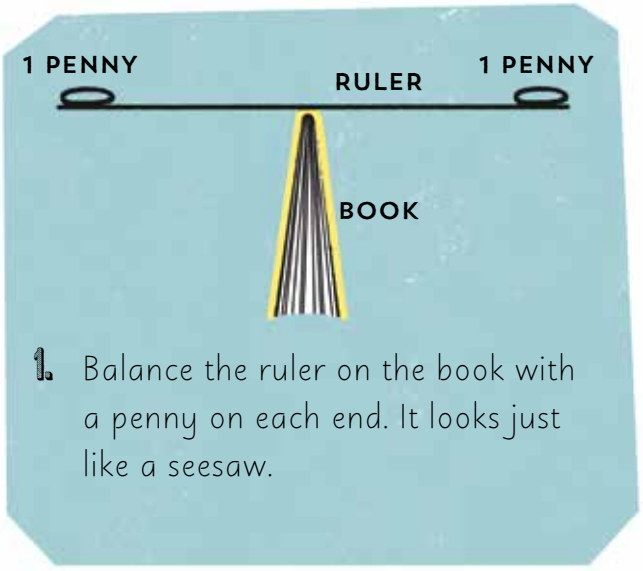
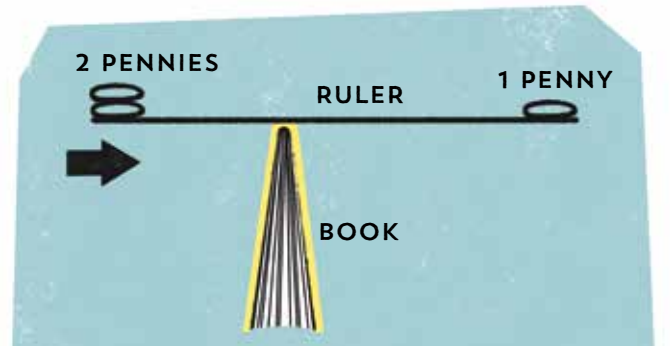
EXPERIMENT WITH LEVERS

You are going to examine how a light weight can lift and balance heavier weights when we move the fulcrum (balancing point).

You will need: a ruler, something to balance it on (a hardback book is perfect), 9 pennies



1. Balance the ruler on the book with a penny on each end. It looks just like a seesaw.



2. Now put two pennies on one end and slide the ruler along until it balances. Make a note of where the top of the book is, using the centimetre marks on the ruler. Write this measurement down in the table.

	DISTANCE (CM)
2 PENNIES	
4 PENNIES	
6 PENNIES	
8 PENNIES	

3. Do the same with four, six and eight pennies.

Activity taken from **Engineer Academy: Are You Ready for the Challenge?**

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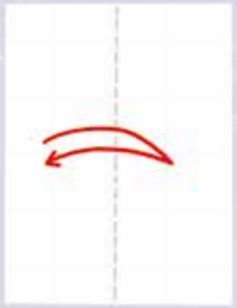
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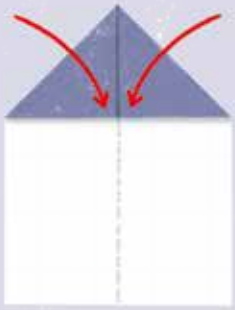
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BUILD A PLANE: THE DART

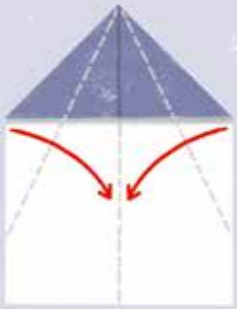
You will need: an A4 piece of paper



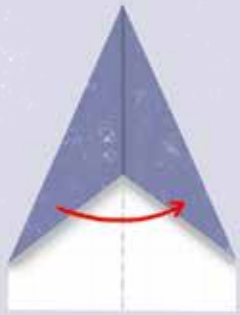
1. Fold the piece of A4 paper in half, lengthways, to make a crease. Then flatten it out again.



2. Fold down the two top corners so they meet at the centre crease.



3. Fold the two edges towards the centre crease, as shown.



4. Fold the plane in half along the crease.



5. Turn the plane on its side. Fold down each wing along the crease, as shown.



6. Fold up the wing edges. Your aerodynamic plane is now ready to fly! Its narrow shape means there is less air resistance, so it can fly quickly.

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DESIGN THE ULTIMATE ROBOT!

Draw the ultimate robot below. First, decide what you want it to do: play games with you, do your homework, make popcorn, and so on. Then think about what it will need to do these jobs – detachable tennis racquet arms, a super-computer brain, a popcorn-maker stomach? Make sure it has a control, moving machine parts, and a sensor.

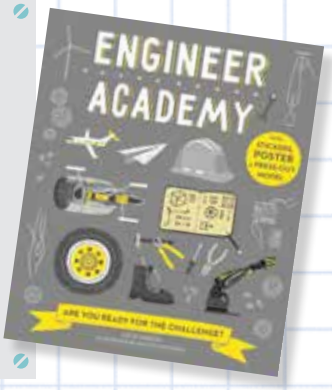
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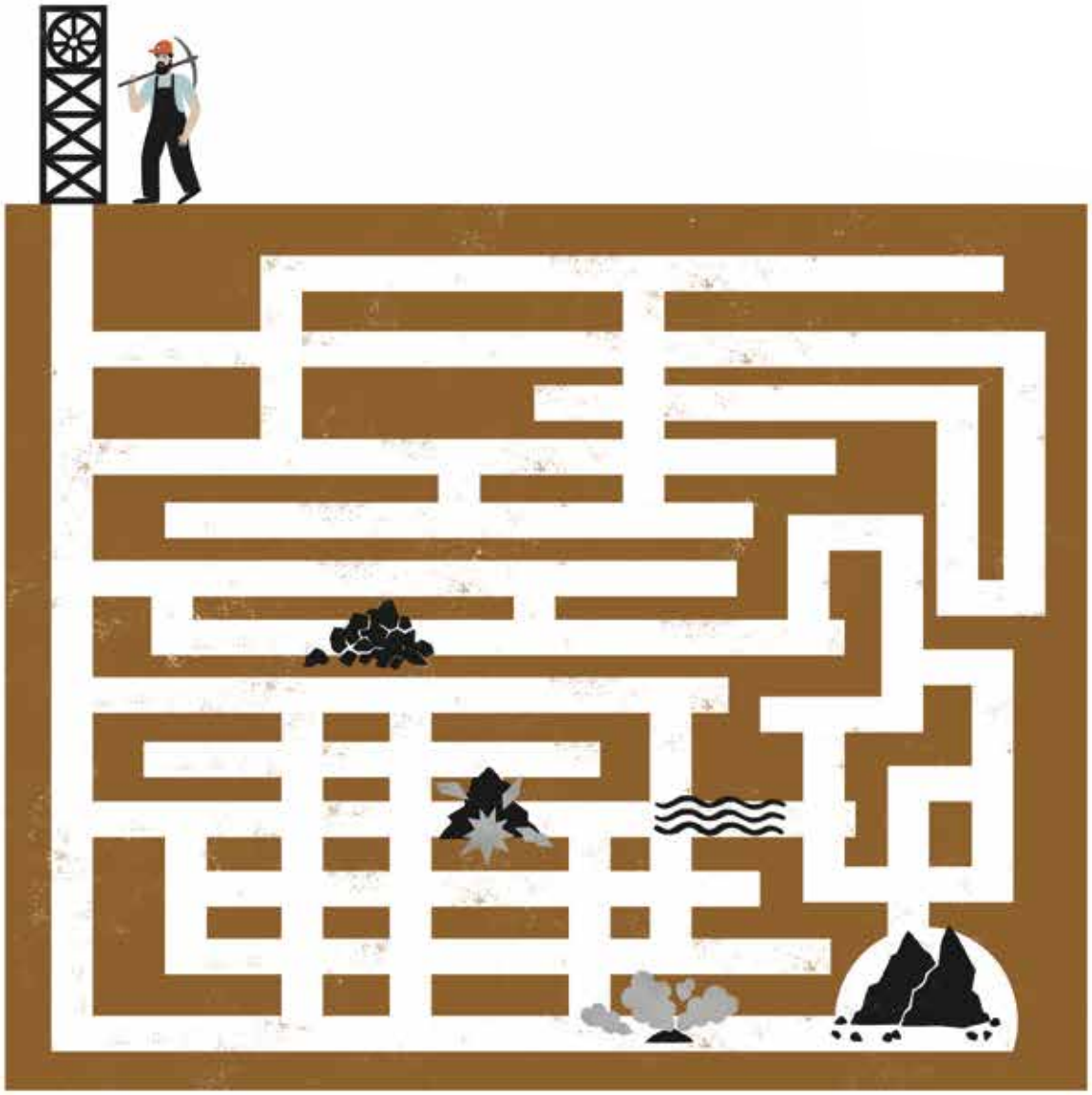
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PRACTISE YOUR PROBLEM-SOLVING

Engineers need to be good at solving problems. To practise your skills, see if you can help the miner find his way to the coal face, avoiding the dangerous mine collapses, floods and gas leaks along the way.



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