

Toy Factory

Discover how toys are made!

These teachers' notes are to be used with Project Pull-out #48, which is found in issue 101 of DMAG. Students will discover how products are made and learn about science by interacting with toys.

This supplement encourages students to:

- Recognise that discoveries can be made by playing with things and experimenting
- Understand that man-made products begin life as an idea
- Appreciate that making a product requires a lot of thought, hard work and planning
- Understand what a process is and how it applies to making toys
- Follow a process themselves and try to write one
- Realise that art is not just for artists but plays an important role in hundreds of industries
- Think about the materials objects are made from and their properties
- Experiment with magnets
- Improve their spatial reasoning
- Be creative and have a go at designing a toy



Science: Toy World

As a class, look at the pictures shown in DMAG of the toys. Explain that the class will be investigating toys, playing with them and having a go at designing some.

Ask each student to bring in a toy. Using the students' toys as examples, discuss how the toys move. Find toy parts that rotate, bend, flex, stretch, twist, bounce, swing etc. Discuss these movements and write the actions on the board.

Explain to the class that many toys mimic the real world. Compare the moving parts of toys to real things - e.g. the wheels on a toy car compared to real cars. Would the toy be as much fun if the wheels didn't turn?

Look at a doll and its various joints. Try turning the doll's head (look for a doll with a head that turns 360°) - how does this compare with how we turn our heads? What about the bending parts of the doll - how do they compare to our movements?

Look at the picture of the dragon shown to the left and on page 47 of DMAG. How do the students think its parts might move?

Would its legs move back and forth? What is the grey thing on the back for? What other parts might be fun to make move?

Science and Art: Design a toy

Ask the students to complete the exercise on the first page of the student activity sheet and design a toy. At each step, show the class some examples of other students' work. Ask students to share their ideas about how their toy will move, and how people will play with it.

English: Creative writing

Ask students to imagine that the toy they've just designed has come to life. What would its personality be like? Ask each student to write a short story describing an incident or mystery their "alive" toy might have been involved in. Read the best stories to the class.

Science: Material World

Using the students' toys as examples, discuss the materials used in making toys. Note: if there are no marbles or wooden toys, try to bring some in to help illustrate your point. Write a list on the board of different materials that toys are made from.

As a class, brainstorm a list of why toys might be made from different



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products. E.g. availability, cost, ease of use, final appearance, weight, special properties like magnetism etc. Use this as a starting point for further investigation.

As a class, read pages 48 and 53 on how toys are manufactured. Ask the students which materials would be suitable for injection moulding. Do the materials need to be molten at some point? Which materials melt at high temperatures? Which don't? How are materials that don't melt – such as wood and stone – shaped? Would this process (e.g. carving) take more time than injection moulding? Would the material be variable? How would materials like these be coloured? Would that extra step add time to the process? Look at toys from the past and discuss what they were made from e.g. wood, shell, bone, fur etc. Why weren't they made of things like plastic and steel? Ask students which products are sustainable e.g. wood, rubber (many students will be surprised that this comes from trees) glass etc. Discuss what sustainable means and where products like plastic are derived from. Discuss which products can be recycled and which are biodegrade.

Science : Experimentation

Discuss with students what a mould is and how injection moulding works. Explain to students that they'll be using a mould to make something too – jelly! Use a jelly mould as an example, but ask students to create their own moulds

- give a prize for the student who creates the most weirdly shaped jelly creation using their mould.

What did students discover when making their moulds? Were some moulds hard to extract the jelly from? What reasons can students come up with for this?

English: Text types – process description

Following on from the above exercise, discuss the process the students used to make their jellies. Ask students to write a list of instructions / steps describing this process. Discuss the main purpose of instructions – to be helpful. Discuss where instructions might be found on an everyday basis, e.g. recipes, with appliances etc.

Science: Stuck on you

Explain to students that they will be investigating the properties of magnets. Look at the pictures of MagNext on pages 54 and 55 of DMAG and discuss how magnets can be used in toys.

Obtain some magnets and

investigate their properties. What objects do they stick to? Complete the activity on page 55 of DMAG which asks students to work out which metals magnets are attracted to.

Ask students to play with the magnets and find the point at which magnets repel. Explain that magnets have two poles and that like poles repel whereas opposite poles attract. Ask students to work out which poles are the same in the magnets you're demonstrating with. If possible, obtain some iron filings and use these to explore the magnetic field around magnets.

Extension exercise: Challenge

Without the students seeing, magnetise a paperclip by running a magnet repeatedly over it in the same direction. Show the students the paperclip and demonstrate that it is magnetised. Challenge the students to achieve the same thing with their paperclips using only a magnet. Don't tell them how you did it, unless no one is able to work it out. Discuss which materials are able to be magnetised.



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* Offer limited while stocks last.