SCIENCE

Lesson 10

Year 1

Topic: Understanding warming and recycling

Analysing physical change to materials in recycling

Lesson concepts

- Everyday materials can be physically changed in a variety of ways
- Science involves asking questions and describing changes
- People use science in their daily lives
- Questioning can be responded to
- Investigations can explore and answer questions
- Observations and ideas can be represented and communicated

Today students will:

► understand the reasons for physical change to materials in the recycling process.

Resources

Sheet

Sheet 14 — Recycling waste

Find and prepare

Collection of clean, empty packaging
(for example, biscuit tray, biscuit box, chip packet, muesli bar wrapper, lolly wrapper, foil from chocolate block, paper wrapper from chocolate block, drink can, food can, milk bottle, plastic lid)

Large cardboard box or shopping bag

Camera

Key terms

recycle, melting

For definitions and explanations of terms, please see the Glossary.

Lesson

Investigate recycling

1. Review with students the learning about making physical changes to materials.

Say to students

"Remember that in the previous lesson you investigated making physical changes to materials for a purpose. The purpose we are going to investigate in this lesson is recycling."

Focus questions

Q. *What do you know about recycling?*

A. For example: Different materials are recycled separately.

Note

You will require a selection of items from the collection of recyclable materials for fitting into the cardboard box or shopping bag. They should be too large to fit as they are, but able to be physically changed by squashing or flattening to make fit.

2. Display **Sheet 14 —** Recycling waste.

Focus questions

Q. *What do you notice about this recycling bin?*

A. For example: There are a lot of things in it. It is too full.

Q. *What do you think could be done so that all the items would fit into the recycling bin?*

A. For example: They could be physically changed to fit it.

Q. *How could you change the cardboard box so it would fit?*

A. For example: I could squash it.

Q. *What else could you do to the materials so they fit?*

A. For example: I could sort them.

a. Give students a cardboard box or plastic container from the collection of recyclable materials.

Focus question

Q. *What can you do to physically change this box (or container)?*

A. For example: I could fold it or squash it.

Say to students

“People use knowledge of making physical changes to materials when they are recycling.”

Analyse space for recyclables

Say to students

“Now we are going to watch a video which shows ways of sorting waste.”

3. Watch the video at **Website — PBS Learning Media ‘Garbage’** https://www.pbslearningmedia.org/resource/lpsc10.sci.life.garbage/garbage/.

   This video demonstrates how waste can be sorted.

Focus questions

Q. *What was Oliver’s challenge?*

A. For example: To make the pile of garbage smaller.

Q. *What did Oliver do first?*

A. For example: He sorted the garbage into different piles.

Q. *What groups did he sort the garbage into?*

A. For example: Glass, tin, plastic, paper — these could all be recycled.

Q. *What else did he sort?*

A. For example: He put food scraps into a compost bin, he made a group of toys and games that were still good.

Q. *How much garbage was left when everything that could be recycled was recycled?*

A. For example: One small bag.

Q. *What does this tell you about garbage and recycling?*

A. For example: If we recycled more things there wouldn’t be as much garbage.

4. Ask students to view the collection of recyclable materials and clean empty packaging.

Say to students

Look at all these materials. Once all of these materials went into the rubbish bin. Now we can recycle many of them. You have just seen Oliver sort his garbage into groups for recycling. Your task is to sort these materials into groups for recycling.

a. Provide time for students to sort the collection of recyclable materials into groups.

Focus questions

Q. *How have you sorted the items?*

A. For example: I have put the paper and cardboard in one group, the plastic things in another group; the tins are here.

Q. *Which of these items could you make physical changes to so that they take up less space?*

A. For example: I could squash the plastic containers, I could flatten the cardboard boxes and tubes.

Say to students

Waste disposal centres sort and compact waste to save space. This involves squashing and flattening waste so it takes up less space and is easier to transport and store.

5. Show students the large cardboard box or shopping bag.

a. Gather a selection of the recyclable materials for fitting into the box or bag.

Focus questions

Q. *Will all of these recyclable materials fit into the box (or bag) as they are?*

A. For example: No.

Q. *How could you make these items fit?*

A. For example: I could squash some, I could pack them in neatly.

Say to students

Your task is to physically change these materials so that they will fit into the box (or bag).

Focus questions

Q. *How could you physically change this cardboard box so that it takes up less space?*

A. For example: I could flatten it.

Q. *How could you physically change this container so that it fits in the box (or bag)?*

A. For example: I could squash it.

b. Provide time for students to physically change and pack the materials to fit.

Note

You may assist or provide suggestions, if necessary.

Focus questions

Q. *What do you notice about the amount of space that the materials take up after you have physically changed them?*

A. For example: They don't take up as much space.

Recycling and physical change

Say to students

"Scientists use knowledge of physical changes to work out ways to recycle materials.

Now we are going to watch some videos about recycling."

6. If you have access to the internet, go to the **Website — Recycle now**.
http://www.recyclenow.com/recycling-knowledge/how-is-it-recycled

Say to students

"There are lots of recycling centres in the world. This website shows how different materials are sorted for recycling."

a. Click on 'Recycling centre' for information on how recycling is sorted.

b. Click on 'Cartons', 'Cans' and/or 'Plastic bottles' to see how those items are recycled.

Focus questions

Q. *How are the materials physically changed when they are recycled?*

A. For example: sorted, crushed, squashed, mixed

Q. *What are the materials used for after they are recycled?*

A. For example: more cans, cardboard

Q. *Why is it important for materials to be recycled?*

A. For example: So that we don't waste as much stuff.

Say to students

"Many different physical changes are made to materials in the recycling process, including crushing, melting, rolling. The changes are made so that we can reuse materials to avoid creating so much waste."

7. Explain to students that another way of recycling is to reuse things instead of buying new things all the time.

   For example:

   Some glass jars or plastic containers are good for storing things instead of buying new containers for the kitchen, toys or even in the shed.

Boxes can also be good for storing things such as shoes at the door.

Fruit and vegetable boxes can be used to grow seedlings.

Old kitchen pots can be used as plant pots.

Some people make candle holders out of glass jars.

Say to students

"You can make something out of recyclable rubbish. Choose whatever you'd like to make. Think about the materials you want to use and how they can be used.

Think about the properties of the materials to make sure they will be suitable to make your item."

Focus question

Q. *What would you like to make?*

8. Display clean, safe recyclable items for students.
   a. Provide time for students to make something of their choice.
   b. Photograph the item made from recycled materials.
   c. Ask students to glue the photo into their Science journals and to label the materials used.

Say to students

"In this lesson, you have learned that physical changes can be made to materials to make them suitable for particular purposes."