

ENGAGE

WHAT ARE METEORITES MADE FROM?

METEORITE DISSECTION

30 MINUTES

SUMMARY

Sure, meteorites are rocks from space. But from what kind of rocks? Studying the rocks themselves can tell us a lot about what kind of planet or asteroid it might be from. Dissection and x-ray style techniques on meteorites can reveal how much upheaval it's had on it's journey and the kinds of minerals it's made from.

We can also compare their composition to that of Earth: iron nickel meteorites are very similar to what we anticipate at Earth's core, so they're probably from the core of another planet that didn't quite make it, or a large asteroid.

In this investigation students will need to be familiar with different types of meteorites in order to make their own models. Borrow some meteorites from your museum, or check them out online. They can be surprisingly varied in looks, texture, density, not to mention size. See the 'Types of Meteorites' fact files for example images.

In this activity students will create a model meteorite using playdough and other household items. The class group will work to a standard system of representation for all the meteorite inclusions (e.g. bead = crystal, see equipment below). Using the key and dissecting the meteorite, students should be able to accurately identify the type and origin.

OUTCOMES

1. Students make, dissect and identify model meteorites by following a key
2. Students provide evidence to communicate their process and result
3. Students learn about different types of meteorites, their make-up and where they come from



What type of meteorite do you have?

EQUIPMENT

- 500 g - 1Kg Playdough or clay
- 50 - 100g of each of the following items in equipment column (or something similar)

| Equipment | Representing |
|------------------|-------------------|
| Pebbles/gravel | Rocky |
| Dried mung beans | Organic molecules |
| Sinkers | Chondrules |
| Yellowish beads | Olivine crystals |
| Magnets | Iron |

- 15 plastic knives or plastering paddles
- Newspaper, placemats or tablecloths
- 'Types of meteorites' fact files, page 85
- Black crepe paper
- Worksheet, page 61

SET UP

1. Provide Types of Meteorites sheets to student groups and note books/worksheets for rough work
2. Set class up in group tables so that they can share resources – provide each group of 6 with 1.5 cups of playdough, a small bowl each of the inclusions, $\frac{1}{4}$ sheet of black crepe paper
3. Protect desks from playdough with newspaper/tablecloths/placemats if desired

THE EXPERIMENT**Plan:**

Students study their meteorite fact files, and get familiar with 'what represents what'.

Students make a meteorite true to one of the types – about the size of a billiard ball and put them all in a box (you may want to designate certain people certain types so that you don't have 30 of one kind)

Predict:

Students take a meteorite to study and predict what theirs is without unwrapping or cutting (see worksheet)

Test:

After careful dissection (slice in two, exposing a flat inner surface), students measure, sketch, label and carefully describe the meteorite. Students make a hypothesis about the origin of the meteorite

Analyse:

Students share their results with a partner to see if they agree.

Communicate:

Students complete the worksheet to create information panels for their meteorite. These can be displayed in the classroom 'museum', grouped by type or suspected origin.

SUGGESTIONS FOR THE CLASSROOM

- Read about types of meteorites together in the fact sheet and online and summarise the information in a table to help students break down the important points.
- See 'edible meteorites' in junior section for more ideas about making meteorites
- Encourage students to use new words from the vocabulary activity when describing the meteorites, after they have used their own language to describe the objects.
- Find out about local area meteorites and what types they are



Imitation carbonaceous chondrite

Students will find it easier to cut meteorites after removing the 'ablation crust' layer