

Source: The **JASON** Project is internationally recognized as an outstanding interdisciplinary and technology rich approach to teaching and learning. These materials are selected components from a comprehensive curricular approach. For more background, check the **JASON** Project homepage: <http://www.jasonproject.org> For more information on the JASON Project, contact: **JASON** Foundation for Education, 395 Totten Pond Road, Waltham, MA 02154 Tel: (617)487-9995 or send e-mail to: info@jason.org Copyright protected. Used with permission.

16. HOW ARE CORAL REEFS FORMED?

The following activity explores how the barrier reef was formed through lithification involving coral polyps and encrusting calcareous algae (coralline algae).

Objective:

Students will demonstrate how a limestone exoskeleton is produced from carbon dioxide and dissolved calcium.

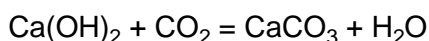
Materials:

- Lime water (Dissolve calcium hydroxide in water and filter until clear.)
- Small cup (empty)
- Small cup, filled to a depth of 3 cm (about 1 in) with lime water
- Two drinking straws
- Small (No.2) coffee filter
- Small cup filled with water

To demonstrate the formation of calcium carbonate, introduce to the students the idea of solids (such as sugar or salt) that dissolve readily in water, and solids (shell, bone, or coral) that do not readily dissolve in water. Ask students to discuss where sugar, salt, shell, bone and coral come from? Are they made up of other solids? Ask students what the coral polyp cups are made of. (Calcium carbonate.) Suggest to them that the coral polyp makes calcium carbonate with the help of zooxanthellae. They combine different chemicals together. Ask for a student volunteer to tell the class the color of the liquid in the cup. Have the student blow into the cup filled with lime water. Remind the student not to swallow or blow too hard. Tell the student to stop blowing as soon as a white precipitate is seen. Filter this precipitate out, using the small coffee filter placed over the empty cup. Repeat the same exercise, using a cup of water instead of the lime water. No precipitate should form. Ask students why the second cup did not produce a precipitate. (The chemicals in the first and second cups are different.) Explain that both cups were supplied with carbon dioxide when the student exhaled. In the first cup, the carbon dioxide combined with a chemical to produce calcium carbonate. What do you think the chemical was? (Calcium, hence calcium carbonate.) In corals, calcium from the water and carbon dioxide from cell respiration are brought into the polyp's gut, where the zooxanthellae assist in combining and moving the chemicals to the area where calcification occurs and the protective cup is formed.

For older students

The chemical reaction in forming calcium carbonate is:



Correlation to National Standards from McREL (<http://www.mcrel.org>) :

Life Sciences

6. Understands relationships among organisms and their physical environment

Physical Sciences

8. Understands the structure and properties of matter