Model tilted rock layers

Predict what the basin will look like after several more sediments are added.
Focus question

• How does limestone form?
Review basin

Pick up two limestone samples for your group.

Review your observations of the limestones from the Grand Canyon. Think about the environment in which these limestones formed.
Discuss limestone observations

1. You found fossils in the limestone samples. What sort of environment do you think this limestone formed in?

2. How do you think the fossils ended up in the limestone layers?
Describe seawater scenario

By using a straw to blow exhaled air through a cup of seawater, we will be able to simulate the effect of an animal living and respiring (breathing out carbon dioxide) in the sea.
Describe limewater

The chemical in the water that makes it similar to the ancient seawater is calcium hydroxide. Ancient seawater contained many other dissolved chemicals as well but calcium hydroxide is the chemical of interest to us today.
Notebook sheet 21, *Seawater Investigation*

<table>
<thead>
<tr>
<th>Observations of Ca(OH)$_2$ cup <em>before</em> bubbling</th>
<th>Observations of Ca(OH)$_2$ cup <em>after</em> bubbling</th>
<th>Observations of Ca(OH)$_2$ cup <em>after</em> standing for 5 minutes</th>
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</table>
Conduct the investigation

Pick up a cup of solution, a lid, and four straws for your group.
Have a sense-making discussion

1. What are your ideas about the appearance of the white material?
2. What happened to the liquid in the control cup?
3. What is different about the gas in our test cups compared with the control cup?
4. How does the air we breathe out differ from plain air?

5. We are using limewater to represent or simulate seawater. What could be adding carbon dioxide to seawater in the ocean?
Have a sense-making discussion

6. What do you think the white material might have to do with limestone formation?

7. How would we check to see if the white material is similar to limestone?
Have a sense-making discussion

• How will we know if the sediment contains calcium carbonate?
Test precipitate with acid

We’ll test the white substance in the limewater cup, the precipitate that formed when it reacted with the carbon dioxide from our breath.

If it fizzes, that will indicate that it could be an ingredient in limestone.
Explain the acid reaction

• Where does calcium carbonate come from, and how does it get into the limestone?
Explain the acid reaction

Teacher master N, *Notes on Calcium Carbonate*
Limestone Formation

View online activity
Turn to “Modern Sedimentary Environments” on page 164.
Read “Where in the World Is Calcium Carbonate?” on page 34.
Review vocabulary

Spend a few minutes reviewing the vocabulary for this part. Update the vocabulary index and table of contents in your notebook.

• ooze
• precipitate
Answer the focus question

- How does limestone form?
Answer the focus question

The first thing to consider is _______
Then, _______.
Other factors are _______.
One example is _______.
The differences are _______; however, what is the same is _______.

Earth History Course, 3.2: Limestone
Step 22
Wrap-Up/Warm-Up

Share your notebook entries with a partner from another group. Provide constructive feedback to each other.

Identify one thing that is effective about the writing and one thing that can strengthen the writing.