

**Focus:** Tidepool Animals

**Grade Level:** K2

**Session Length:** Four activities of 20-30 minutes each

***Driving Questions***

- What tidepool animal took the missing shell?

***During Week 2: Mystery of the Missing Shell, students learn about tidepool animals and investigate which animal stole the missing shell.***

On Day 1, students are introduced to the mystery of the missing shell and learn that there are four tidepool animals that are suspects for who stole the shell. They learn about the missing shell by examining shells, looking at suspect cards, and drawing the shells and the animal suspects. On Day 2, students take a virtual tour of the tidepools to learn about the animals that live there. On Day 3, students learn how and why hermit crabs change shells and decide if they think the hermit crab stole the shell. On Day 4, students build a model of a hermit crab shell out of clay and decorate it with watercolors.

***Learning Outcomes and Assessments***

<i>By the end of this module, students will be able to...</i>	<i>You can assess this using...</i>
<b>1. Describe</b> at least one animal that lives in a tidepool.	Class discussion; Reporter notebooks on Day 1 and Day 2
<b>2. Use</b> evidence to support their claim about who took the missing shell.	Reporter notebooks on Day 3
<b>3. Build</b> and decorate a model of a hermit crab shell.	Student-created shell on Day 4

## Weekly Sequence

Sequence	Description	Length	Location
Day 1	<p><b>Missing Shell: Breaking News!</b></p> <p>Students are introduced to the mystery of the missing shell and learn about the four tidepool animals who are suspects by using suspect cards and drawing the animals.</p>	20-30 minutes	Classroom
Day 2	<p><b>Missing Shell: Virtual Tidepool Exploration</b></p> <p>Students learn more about the tidepool animals by going on a virtual exploration of the tidepools.</p>	20-30 minutes	Classroom
Day 3	<p><b>Missing Shell: Make an Argument</b></p> <p>Students learn about why and how hermit crabs change shells by watching a video. They decide if they think the hermit crab took the shell and write their argument for their decision in their notebook.</p>	20-30 minutes	Classroom
Day 4	<p><b>Missing Shell: Build a Shell</b></p> <p>Students use clay to build a hermit crab shell and use watercolors to decorate it.</p>	20-30 minutes	Classroom

## Big Science Idea

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The rocky intertidal ecosystem is found where the ocean meets the shore. Animals that live there are adapted to live in a harsh environment and must cope with several factors that make it a challenging place to live: crashing waves; changing tides that expose animals to air at low tide and submerge them under water at high tide; changes in temperature, oxygen, and salinity in tidepools during low tide; and predators. Even though it is a harsh environment, many animals have found ways to survive there. Adaptations include shells to protect animals from waves, desiccation, and predators; the ability to hold on tightly to a rock; the ability to hide under rocks; and the use of camouflage to hide from predators just to name a few adaptations.

Hermit crabs are one of the animals that use shells for protection. They can't build the shells themselves, so they move into empty snail shells that have been left behind when a snail dies. As a hermit crab grows, it must find a new shell that is slightly bigger. It can't survive outside of a shell for too long because it is vulnerable to predators and waves when it isn't protected by a shell. A hermit crab that is looking for a new home may fight other hermit crabs for a shell, but it won't take a shell from a snail that is still living in the shell.

### *If you want to learn more...*

- [\*The Rocky Shore\*](#)
- [\*Hermit Crabs\*](#)

### *If you want to share more with students...*

- [\*Book Reading: A House for a Hermit Crab\*](#) (The video includes two readings of the book, and students act out the actions of the animals during the second reading.)
- [\*Book Reading: In One Tidepool\*](#)
- [\*Crystal Cove State Park's Tidepool Videos and Activities\*](#)

Day 1

**Breaking News: Missing Shell**  
(20-30 minutes)

Each teacher will need...	Each student will need...
<ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Day 1 Slideshow</b></li> <li><input type="checkbox"/> Computer, projector, and speakers</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Reporter notebooks</li> <li><input type="checkbox"/> Pencil</li> <li><input type="checkbox"/> Suspect cards</li> <li><input type="checkbox"/> Shells</li> <li><input type="checkbox"/> Colored pencils</li> </ul>

**Before you start teaching...**

- Open the day's slideshow and check to make sure that the videos play with sound.
- Gather the shells.
- Gather the colored pencils.

**Instructional Learning Sequence**

1. Open the slideshow and play the video on **Slide 2** for the class. Kaitlin will share the breaking news that one of her favorite shells was missing when she visited the tidepools and she wants your students to help figure out who stole the shell.
2. Advance to **Slide 3** and play the video. Kaitlin will explain that the students will learn more about what the tidepools look like at different times of the day by looking at two photos.
3. Move on to **Slide 4**, which shows two photos of the same tidepool at different times of the day: high tide vs. low tide. Ask the students to share what they observe about the two photos. How does the tidepool look different? Facilitate a short discussion so students can share their observations.
4. Move on to **Slide 5** and play the video. Kaitlin will explain what happens during high tide and low tide to make the tidepool look different.

5. Move to *Slide 6* and play the video. Kaitlin explains that in order for students to solve the mystery they need to get to know the suspects. She sent samples of shells and cards with information about the suspects to the classroom for the students to use to learn more about the suspects. She also explains how the students will use their reporter notebook to record their observations.

After playing the video, give students time to write “missing shell” and the name of each suspect (ochre star, hermit crab, wavy turban snail, and sea anemone) on the top of separate pages in their reporter notebook. Tell them that you will give students suspect cards and pass around shells for students to sketch.

6. Move to *Slide 7*, which shows the directions of what the students will do. Ask students to draw a sketch of the missing shell and all of the suspects on the appropriate page in their notebook. Give students crayons, colored pencils, or markers to draw their sketches. Give students time to draw and label their sketches. Walk around the room to check on progress and answer any questions. Remind students to pass the shells around the room so everyone gets the chance to see a shell.

7. Once students have finished their sketches, move to *Slide 8*, which has two questions that you can use to facilitate a class discussion:

- Who were the four suspects?
- What is one thing you’ve learned about each suspect so far?



**Virtual Tidepool Exploration**  
(20-30 minutes)

<i>Each teacher will need...</i>	<i>Each student will need...</i>
<ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Day 2 Slideshow</b></li> <li><input type="checkbox"/> Computer, projector, and speakers</li> <li><input type="checkbox"/> <b>Virtual Tidepool Tour Video</b></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Reporter notebooks</li> <li><input type="checkbox"/> Pencil</li> </ul>

*Before you start teaching...*

- Open the day’s slideshow and check to make sure that the videos play with sound.

*Instructional Learning Sequence*

1. Open the slideshow and play the video on *Slide 2*. Kaitlin will explain that she has an expert who will share more information about Crystal Cove’s tidepools. Kaitlin will introduce the video of Alex who will take the students on a virtual tour of the tidepools at Crystal Cove’s Marine Protected Area. Remind students to have their notebooks ready to take notes about animals.

2. Move on to *Slide 3* and play *the video of Alex*, Crystal Cove State Park’s tidepool interpreter, who will introduce the students to the marine life that lives in the tidepools. Ask students to take notes about what they learn about the four suspects. You may need to pause the video at certain points to give students time to write notes about the animals.

3. Move to *Slide 4* and play the video. Kaitlin will ask the students to reflect on what they learned about the four suspects and share their new knowledge with their classmates.

4. Move on *Slide 5*, which has the directions for a class discussion. Facilitate a class discussion where students can share what they learned about the following suspects:

- Ochre star
- Hermit crab
- Sea anemone
- Wavy turban snail



**Make an Argument**  
*(20-30 minutes)*

<i>Each teacher will need...</i>	<i>Each student will need...</i>
<input type="checkbox"/> <b>Day 3 Slideshow</b> <input type="checkbox"/> Computer, projector, and speakers	<input type="checkbox"/> Reporter notebooks <input type="checkbox"/> Pencil <input type="checkbox"/> Colored pencils

*Before you start teaching...*

- Open the day's slideshow and check to make sure that the videos play with sound.
- Gather the colored pencils for the class.

*Instructional Learning Sequence*

1. Open the slideshow and play the video on *Slide 2*. Kaitlin will provide an update that she saw her favorite shell moving during a recent visit to the tidepools. She will do some more research on why the shell might have been moving and will ask the students to discuss their ideas about why it was moving.

2. Move on to *Slide 3*, which has the instructions for the students to share their thoughts on the following question out loud:

- Why do you think the missing shell appeared again?
- Why was the shell moving?

Facilitate a class discussion about their ideas for why the shell might be moving. Ask them if they learned anything from Alex during their virtual tidepool visit that might help them answer the question.

3. Move to *Slide 4* and play the video. Kaitlin will remind the students that Alex mentioned that hermit crabs live in shells. Kaitlin will also introduce a video of a hermit crab that explains why a hermit crab changes shells and shows what a hermit crab looks like when it isn't in its shell. She will also ask the students to draw what a hermit crab looks like when it isn't in its shell.

4. Next, move to *Slide 5* and play the video of hermit crabs changing shells.

5. After watching the video, move to *Slide 6*. This slide will have a photo of a hermit crab without its shell so that students can draw it in their reporter notebook. Give colored pencils and give them time to draw the hermit crab. Walk around the room to check on progress and answer any questions.

6. Move on to *Slide 7* which asks students to answer the question about whether the hermit crab took the shell and why they think that.

Day 4

**Build a Shell**  
(20-30 minutes)

Each teacher will need...	Each student will need...
<ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Day 4 Slideshow</b></li> <li><input type="checkbox"/> Computer, projector, and speakers</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Reporter notebooks</li> <li><input type="checkbox"/> Pencil</li> <li><input type="checkbox"/> Clay</li> <li><input type="checkbox"/> Watercolors</li> </ul>

**Before you start teaching...**

- Open the day's slideshow and check to make sure that the videos play with sound.
- Gather the clay and watercolors supplies.

**Instructional Learning Sequence**

1. When you open the slideshow, advance to **Slide 2** and play the video. Kaitlin will thank the students for solving the mystery of the missing shell and ask the students to build a shell for a hermit crab out of clay.
2. Move to **Slide 3** which has the following steps for students to design a home for a hermit crab:
  - Look back at your drawing of a hermit crab without a shell. Make sure there's enough space inside for the hermit crab!
  - Think about ways to protect them from being eaten.
  - Create a nice, cozy space.

Review the directions with the students and ask if anyone has any questions.

3. Hand out clay and watercolors to each student. Give them any directions they need about using the watercolors and cleaning up after using them. Give students time to build and decorate their shells. Walk around the room to check on progress and answer any questions.

Paint may rub off from the clay when dry. Demonstrate to the students how to gently handle their shells, or handle the shells when complete on their behalf.



If there is time when the students have finished, ask them to share their shells with the class. You could also have them share with a partner or in small groups if there isn't time for a full class discussion.

4. Move on to *Slide 4* and play the video. Kaitlin will thank the students for their help and encourage them to visit the tidepools with their families if they have the opportunity.