

Focus: Developing Solutions
Grade Level: 7-12
Session Length: At least one session of 45-60 minutes

Driving Questions

- How can we share our solution back with Crystal Cove State Park?

NGSS Links

- Engage in Argument from Evidence
- Obtaining, Evaluating, & Communicating Information

In the tenth and final session of the Coastal Dynamics Program, student project teams decide how to share their solution with Crystal Cove State Park.

First, students take time to reflect individually on their solutions and consider what might be the most important messages to communicate. Afterwards, they work together to design a presentation to share their solution with their broader community, including the natural resource managers at Crystal Cove State Park.

Learning Outcomes & Assessments

<i>By the end of this module, students will be able to...</i>	<i>You can assess this using...</i>
1. Identify key ideas or messages that they want stakeholders to understand related to an environmental engineering problem.	Field notebooks
2. Design a presentation that tells the environmental engineering story of the problem that they're trying to solve.	Student presentations
3. Reflect on why communication is an important part of environmental engineering.	Field notebooks

Session Overview

<i>Section</i>	<i>Description</i>	<i>Length</i>	<i>Format</i>
Launch	Erick welcomes the students to Session 10 and explains the importance of communicating the solutions that they developed and explains that students will work on finding a way to share the solution they have created with the stakeholders at Crystal Cove State Park.	5 minutes	Whole class
Explore	Students will work in their teams to identify the key ideas of the changes that are happening at the North Beach, the model they created, their problem statement, and their proposed solution. They will work together to create a presentation that communicates that information to stakeholders at Crystal Cove State Park.	40-45 minutes	Project teams
Share	Students share their presentations with their classmates. (Optional)	5-10 minutes	Whole class
Reflect	Students reflect on their experience during Session 10 and the entire Coastal Dynamics program.	5 minutes	Individual

The Environmental Engineering Process: Sharing the Solution

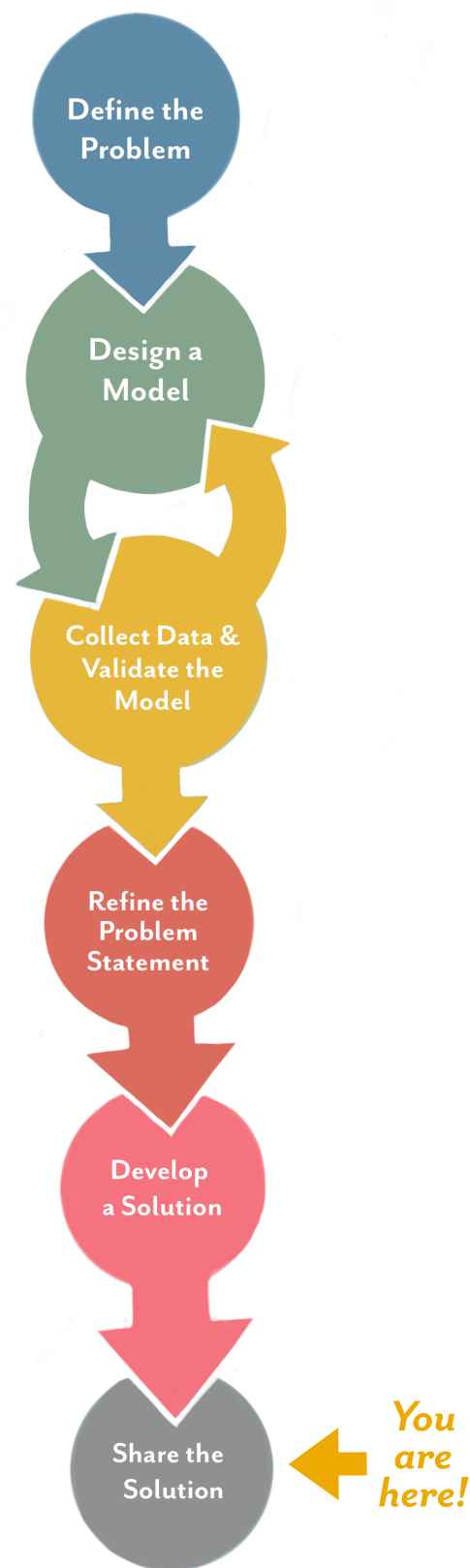
In Session 10, students share their solution by designing a presentation that tells the environmental engineering story of how Crystal Cove State Park’s North Beach is changing over time.

Once engineers have designed and optimized a solution, it is time to consider how best to share that solution with others. When communicating their work, engineers need to do more than simply share their final plans – they must provide context for their client and other stakeholders by describing the project that they intended to solve, outlining the steps that they went through in the design process, and sharing evidence to support the claim that their solution meets design criteria. Carefully developing a communications plan can help engineers convince others that their solutions are workable.

This session requires students to leverage what they’ve learned throughout the program in order to put together a coherent explanation of how the North Beach is changing over time and an argument that their proposed solution is the best. They will need to draw from the model that they created and refined in Sessions 3-7 to describe how the beach is changing over time, the problem statement that they created in Session 1 and refined in Session 8 to describe the problem that their solution addresses, and the solution that they developed in Session 9. The act of formalizing their thoughts and sharing them with others requires students to plan what they want to share and who they want to share it with.

Session 10 will also help students to solidify their own thinking. As they look back over their field notebooks and models and decide what to share and how to communicate it, they’ll have a chance to process what they’ve learned and formalize their ideas. This is an important skill set that is transferable to other career areas, including business, communications, and more.

This final session allows students the opportunity to choose how they want to share their findings with their audience. Where possible, we encourage you to give students agency by offering them “Voice and Choice” in how they present their findings and who they share it with. This can involve offering multiple options for a final product. Although this session focuses on creating a presentation, students could also write a letter to a stakeholder, design a poster or public service announcement, or film a video.



Virtual Materials

- *Session 10 Google Slides Presentation*
- *Session 10 Field Notebook Template* (optional)

Each student will need...

- A device with internet access (a computer, smartphone, or tablet will all work!)
- Field notebook and pencil
- The refined problem statement that students completed in Session 8.
- The solution that students completed in Session 9.

Before You Start Teaching

- Copy over the *Session 10 Slideshow* to your own Google Drive account. Test to make sure that the videos work. (If not, you may have to check the permissions on the Crystal Cove Conservancy Youtube Account.)
- Decide how long to give students for this session. You may want to plan to break Session 10 into two class meetings if you want each team to share their presentations with the class.
- Decide what options you want to give students for their final presentation. You can stick to something more formal such as a slideshow or let them choose between different options, such as writing a letter or creating a poster.
- Make sure students will have access to their field notebooks, their problem statements, and their models from earlier sessions.

Learning Sequence

Launch

Introduction to Session 10 (5 minutes)

1. Open the [Session 10 Slideshow](#) and play the video on [Slide 2](#) for your class. In this video, Erick will explain the importance of communicating solutions to stakeholders and that the students will work with their teams to decide on a way to present the work they have done over the last nine sessions to the stakeholders at Crystal Cove State Park.
2. After watching the video, advance to [Slide 3](#), where you will find a graphic of the environmental engineering process with a marker pointing at “Share the Solution.” Tell students that today, they will move on to the final step in the Environmental Engineering process by deciding how to share their solution with Crystal Cove State Park and other stakeholders.
3. Once you’ve gone over this step in the engineering design process, advance to [Slide 4](#) to give students an overview of what they will do and learn during Session 10.

Explore

Developing a Solution (40-45 minutes)

1. Advance to [Slide 5](#) and play the video. In the video, Erick explains that it is helpful to consider key messages that students want to convey in their presentation before deciding on a format. He asks students to spend some time working individually to think about key messages and write their thoughts in their field notebook.
2. After watching the video, advance to [Slide 6](#). This slide includes written questions that students can use to help them think about the key messages they want to convey. Give students time to consider the questions and write their answers in their field notebook. Make yourself available for any questions that might come up while they are considering the questions.
3. Once students have answered the questions in their field notebook, move on to the [Slide 7](#) and play the video. In the video, Erick will direct the students to work with their teams to decide on a presentation format that will allow them to effectively communicate the key messages for their project and provide students with what to keep in mind as they work on their presentation

4. After watching the video, advance to *Slide 8*. This slide contains written information about what the students should include in their presentation. Give students time to work with their team to decide on a presentation format and create their presentation. Encourage students to think about a range of options for their presentation before deciding on one. Make yourself available in case questions arise while they are working on their presentations.

Sharing Our Model Updates (5-10 minutes)

Share

1. If you have time, you can ask your students to share their presentations with the class to get feedback so they can make revisions. If you choose to do this step, advance to *Slide 9*. This slide gives directions for sharing presentations with the class. You can update this slide if you have a particular format you want to use for sharing (e.g., a gallery walk). The timing for this section will vary depending on the number of teams you have and the duration of each presentation. If there isn't time to have each team give their full presentation, each team could give a brief summary of their presentation by explaining the format that they chose for their presentation and any details they would like to share about it.

Reflect

Reflecting on Session 10 (5 minutes)

1. At the end of the presentations (if you chose to do that step), advance to *Slide 10* in the slideshow and play the video, where Erick will recap the experience today and ask students to spend a few minutes reflecting.
2. Move on to the final slide, *Slide 11*, which will share reflection questions. Ask students to spend five minutes reflecting on their experiences today in their field notebook.
3. Finally, thank for their time today and for all of the work they did to complete the ten sessions of the Coastal Dynamics program. If you are choosing to include the optional extension of a community presentation, provide the students with the next steps for that portion of the program.