



CAREER EXPLORATION: Math and Science Movers and Shakers

LEVEL: 1

ESTIMATED TIME: 60 minutes



CAREER EXPLORATION AREAS

STEM

This lesson is intended to increase students' awareness and understanding of the various career pathways within the fields of science, technology, engineering, and mathematics. Each STEM lesson will incorporate learning objectives from one or more of the core career explorations areas: personal discovery, career evaluation, career awareness, and career preparation.

Career Awareness: Career Exposure

Identify tools and resources to gain information about various careers.

Describe basic categories of career information, such as tasks, activities, skills, education requirements, and employment information



CORE SUBJECTS

Science

Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.



MATERIALS/SUPPLIES

Material A Support Slides: Math and Science Movers and Shakers

Material B Structured Stationery: Reflecting and Projecting

Material C Access to Pathway2Careers Platform



OVERVIEW OF THE LESSON

Students will explore occupational opportunities in the STEM cluster by looking at the tasks, skills, and requirements of these career choices. Students will explore the Science and Mathematics pathway to broaden their understanding of the opportunities in the STEM cluster.



SUMMARY OF ACTIVITIES

1. Students will engage in a 'Notice and Wonder' activity with a display of data and be asked to consider the science and math concepts/skills embedded in this task.
2. In pairs or groups of three, students will engage in a guided exploration of the P2C Career Library to look for and compare occupational opportunities in the Science and Mathematics pathway of the STEM cluster.
3. Students will reflect on what confirmed their understanding about these occupational opportunities and what surprised them throughout the process.



LAUNCH

Estimated Time: 5-10 minutes

1. Launch with a **Notice and Wonder** using the Math and Science Movers and Shakers Support Slides, slide 2 (Material A). The purpose of this launch is to "hook" students with an interesting display of data science and invite them to learn more about the relevant concepts within the demonstration.

INSTRUCTIONAL STRATEGY

Notice and Wonder is a strategy that helps to make complex information accessible for all students with two low-stakes questions. By thinking about these two questions and responding, students gain entry into the context and might get their curiosity piqued.

Steps for 'Notice and Wonder':

- Show students a piece of media, a representation, or information organized in a specific form, such as in a list. Offer students prompts such as "What do you notice? What do you wonder?"
- Give students a few minutes to write down things they notice and things they wonder.
- After students have had a chance to write down their responses, ask several students to share.
- Record the things they report for all to see.

SUGGESTION

Additional resources can be found in the slides including links to the source material, research behind Data Talks, suggestions for implementing the routine, and information on how to find alternative visual displays for this launch.

EXAMPLE OF GUIDING LANGUAGE

What do you notice? What do you wonder? What is going on in this visual representation? What impact does this information have on you?

2. After some private think time, ask students to share what they notice and wonder while you scribe their responses in order **collect and display** their input.

3. After this discussion, prompt students to think about who would need to interpret the presented data and why.

MODIFICATION

For students needing additional support, consider offering more information about the graph through a talk-aloud session on what the graph depicts. Ask them to identify:

- What surprises you?
- What does the display say and or not say about the data?
- What sort of math or science do you see in the representation? Or, what math and science skills would you need to call on to make sense of the information?
- Who might need to know this information and why?



EXPLORE

Estimated Time: 40 minutes

4. Continuing from the Launch, present the idea that interpreting data is an important skill used in many STEM occupations and includes knowledge, skills, and abilities directly related to math and science. Explain to students that these skills may not always be thought of as “math and science skills.” Share with students that today they will be exploring occupations in the STEM cluster that are specifically in the Science and Mathematics pathway to learn about the variety of career options available.

EXAMPLE OF GUIDING LANGUAGE

Being curious and asking questions about the world around us is an important STEM skill. Making connections and seeing patterns like you just did in the Launch is a valuable trait to have when pursuing STEM occupations. Let’s further explore occupations that might use STEM skills that you may already know about or perhaps didn’t know that you have!

5. Group students in pairs or groups of three to explore occupational opportunities in the STEM Cluster, specifically in the Science and Mathematics pathway, using the P2C Career Library. Although students are working together, each is responsible for their own structured stationery (Material B) in the activity. The goal of this exploration is to discover opportunities that students may already associate with STEM overall, as well as occupations that they didn’t know were STEM-related. Students will mostly use the following two icons:
 - a. What do people do in this job? (*Which includes tasks, activities, work environment*)
 - b. Who is ready for this job? (*Which includes knowledge and skills used in this occupation*)



**What do people
do in this job?**



**Who is ready for
the job?**

6. Review the Reflecting and Projecting structured stationery (Material B) with students and provide time to explore the Career Library.

EXTENSION

To connect in a real-world context, consider reaching out to regional employers in STEM Science and Mathematics related fields, if possible, for some of the more surprising STEM occupations, or based on class interest. Invite students to generate a list of questions they would have for employers in this field and, if possible, communicate those questions with the employer, requesting a response.



SUMMARIZE

Estimated Time: 15 minutes

7. Prompt students to summarize their learning in using a **3-2-1** summary routine. Look for trends and patterns in students' responses to the following prompts:
 - Write 3 things that you learned about STEM occupations that surprised or confirmed your knowledge.
 - Write 2 STEM related tasks or skills that connected with you.
 - Write 1 question you have about a specific STEM occupation after this exploration.
8. With time permitting, share out, and scribe student responses, or you may choose to privately collect and analyze the responses of the class.

INSTRUCTIONAL STRATEGY

3, 2, 1 is a reflection strategy that helps students structure their responses to a discussion prompt or an activity. It helps students identify critical points they can focus on by asking them to reflect on and list a specific number of details given a prompt, which helps reduce overwhelm and helps students key in on particular items.

Steps for 3, 2, 1:

- Ask students to reflect on an activity or a lesson by describing three takeaways
- Ask students to list two questions they still have
- Ask students to provide one thing they enjoyed

You can use a wide variation of this strategy to address the needs of your students, e.g., asking students to list their top 3 interests, 2 things they learned about a career within their interest, including knowledge, skills, abilities, or data related to this career, and 1 Action Step they will take towards their career pathway.

EXTENSION

Use the questions generated from the 3-2-1 summary to begin organizing a list of questions students have about STEM occupations and look for potential answers to those questions through regional employers and/or professionals in those STEM occupations.



MY CAREER PAGE

This lesson includes activities that allow students to collect their ideas and understanding about their new learning. Artifacts from these activities should be saved to each student's My Career Page journal to provide a summary of their career exploration learning and discoveries. Students can choose the format they would like to use for their artifacts, such as journal entries, video/audio entries, and/or document upload.

Suggested Artifacts

1. Upload of structured stationery (Material B).
2. Upload of 3-2-1 summary prompts:
 - a. Write 3 things that you learned about STEM occupations that surprised or confirmed your knowledge.
 - b. Write 2 STEM related tasks or skills that connected with you.
 - c. Write one question you have about a specific STEM occupation after this exploration.
3. Bookmark 1-3 STEM careers of interest from the Science and Mathematics Pathway.