

Possible Futures



Facilitator Guide: How to Prepare for This Lesson



STEMPLORATION

Health Sciences – Lesson 4

The Skeletal System

Possible Futures



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About This Facilitator Guide

This facilitator guide provides the details to help you enable students to complete the lesson on **The Skeletal System - How Do Bones Heal?**

Instructions for using the SCORM files in Blackboard and Canvas can be found at this [link](#). Instructions for using Flipgrid can be found in this guide.

While this lesson is designed for online learning, you will find information in this guide about In-Person Learning Adaptations to help you facilitate your students who may be completing this lesson in the classroom instead of online. Call-outs will provide guidance on how to adapt various activities for in-person learning.

Before You Get Started

Before you get started with this lesson, please be sure to:

- Read through the facilitator guide.
- Download SCORM. (You will only need to add SCORM once. After that, you will be set to use SCORM for any remaining lessons.)
- Review the Rise lesson.
- Prepare any resources needed for the lesson.
- Set up Flipgrid.

Flipgrid Instructions – Setting up Flipgrid

Both educators and students will need to set up Flipgrid for use.

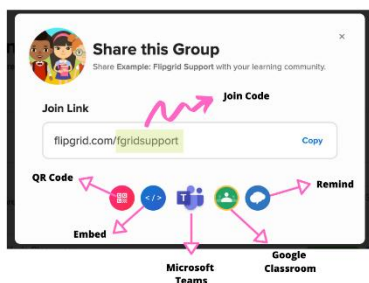
Educator Step-by-Step Guide

Set up your free educator account at [Flipgrid.com](https://flipgrid.com) and create a **Topic** for the class. Please copy and paste the heading from the facilitator guide that pairs with the Flipgrid so that the topic aligns with student expectations. A Topic is a discussion prompt for students. Students respond to the Topic with a short video using our fun, social-media-style camera. Students can watch and comment on videos from peers, with the educator in complete control.

1. Create a Topic

Topics start the conversation in Flipgrid. Just write a prompt and include anything for students to review before responding, such as videos and links.

When you create a new Topic or Group, a Join Code is automatically created for it. To share the Join Code to your Topic or Group, log in to your educator account and select the blue Share button to access your Join Link and Join Code, as well as other ways to share your discussion.



The Join Code also creates a link. Copy/paste the link in emails, texts, social media, Google Classroom, or other websites to invite your students to join. You can download/print QR codes for students to scan on the Flipgrid app. The Flipgrid app and flipgrid.com offer a QR scanner on the homepage.

The student receives the Join Code in the form of a link, a code, a QR code, or a guest username and password. The student can then enter the student username or password.

2. Set Access and Share

After creating the Topic, choose how students will access it. If they have email addresses, add the domain (everything after the @ symbol in their email address). If students do not have email addresses, create usernames for each student. Invite families and guests by adding a guest password.

Share the Topic by using one of the Share buttons or copy and paste the unique Join Code wherever you connect with your community.

3. Students Respond

After entering the Join Code, students gain access by logging in via email or username.

Students can share their voices by recording a short video with Flipgrid's fun, simple, and powerful camera. It is packed with everything they need to tell their story, including text, emoji, inking, boards, screen recording, and the ability to upload clips.

References:

[Educator Step-by-Step Guide](#)

[Educators: A Teacher's Guide to Flipgrid \[YouTube\]](#)

[Educator Guide to Flipgrid](#)

Student Step-by-Step Guide

A student can create a video to submit to the educator in a few easy steps!

1. **Locate the Join Information From Your Educator**

Your educator would have given you one of these ways to join the discussion:

- A Join Code (e.g., FGrid3567, a591dc5d) or a QR code
- A Join Link (e.g., <https://flipgrid.com/FGrid3567>, <https://flipgrid.com/a591dc5d>)
- If you don't have a school-provided email, then a unique username or guest password
Flipgrid works on most web browsers and mobile devices. Microsoft Edge or Google Chrome is recommended for the best web experience. For easy access to Flipgrid, download the Flipgrid extension. On mobile devices, download the free Flipgrid app for iOS and Android devices.

2. **Join the Discussion**

Get the educator's discussion by using the link or code provided by your educator in Step 1.

- If you have a Join Link, select that link.
- If you have a Join Code,
 - Go to your web browser and enter <https://flipgrid.com>. You'll see an area to enter a Join Code. Type the Join Code and press Enter on your keyboard.
 - On the Flipgrid mobile app, enter the code.
- If you have a QR code, scan the QR code with your device camera or the Flipgrid mobile app.

You'll see a prompt to log in. Enter the student username or password. If your student username or password is not working, be sure to double-check the case and space sensitivity.

Tip: If you're prompted to log in, choose Google if your school uses Google Classroom, Docs, and Drive. Choose Microsoft if your school uses Word, OneDrive, or Microsoft Teams.

3. **Record and Submit**

Once you've joined, you'll see your educator's Topic or discussion prompt. Follow the instructions and when you're ready to record, select the red Record a Response button or the Flipgrid logo for the camera to start.

When you're in the Flipgrid camera, you can record a video in these three easy steps:

- Tap to record: Tap the record button on the bottom to start. Add fun stickers, filters, text, and more. Tap the arrow on the bottom-right to advance.



Review your video: Trim, split, rearrange, or add more. Tap the arrow on the bottom-right to advance.



Submit your video: Edit your cover image and name, add a title, or attach a link. Then submit!

The Flipgrid camera offers a lot of fun and creative ways for you to share your ideas and voice! [Check out all the camera features here](#). Learn [how to import a custom video](#) or [how to include a screen recording](#).

References:

[Getting Started: Students](#)

[Getting Started with Flipgrid - Students \[YouTube\]](#)

Using Editable PDFs

Most lessons include the use of an editable PDF for students to capture responses to questions and other activities.

Guiding language is included in the lesson to help students access and use the editable PDFs where they appear.

For students who will be using Chromebooks, they need to use the Print to PDF function to save their editable PDFs to their device. Here's how to do this:

1. Open the editable PDF and select CTRL + P.
2. Open the file destination where the file will be saved.
3. Select Save as PDF.
4. Select Print. Your document is now "printed" as a PDF file which will save your work.

PDFs cannot be submitted via the Rise activities. If you plan to collect these documents for career planning portfolios or grading, you will need to coordinate that with your students.

To view a video on using Flipgrid and editable PDFs in the lessons, select [this link](#).

Ask an Expert Interviews (Optional)

You may choose to include an “Ask an Expert” interview in this lesson.

An interview provides an opportunity for students to talk with and ask questions of experts who work in various professions to learn about their career journeys, current job roles and responsibilities, and glean valuable insights.

Additionally, an interview also provides the following benefits to the students:

- Real-world information about careers
- An awareness of the workplace habits and interpersonal skills needed to succeed in any job
- Further encouragement to go to college or post-secondary training, apprenticeship, etc., and get ready for the career of their choice
- An understanding of the fact that each person’s career journey is unique and that most people encounter obstacles and challenges that they must overcome to reach their goals

When selecting experts to participate in the small group interviews, look for “down to earth” people who you think are good speakers and who would be comfortable talking to young students, ages 12 to 14. An ideal ratio is one expert for every five students.

There are two options that can be used if you choose to use an Ask an Expert interview:

- Schedule a Zoom/Skype call with an expert in the field.
- Find an existing YouTube video of an expert to share with the students.

In-Person Learning Adaptation: For in-person learning, project/share the Zoom/Skype call with an expert with your class. YouTube videos may also be projected/shared in-person. You can consider facilitating further discussions on the key takeaways from the session and/or a specific topic discussed in the session.

Review the following resource for additional information:

[Career and College Exploration Experiences: Planning for Success](#)

How to Implement This Unit

For students to get the most value from this unit, please plan on implementing all lessons in this unit in sequential order.

When it may not be possible to implement the entire unit, we recommend implementing the following lessons to support optimum student learning based on the time available:

- Mini Unit: Lessons 1 through 5 in sequential order
- Standalone Lessons: Lessons 1 through 11 can each be used as standalone lessons.
- Pairs: Lessons 8 and 9; Lessons 3 and 11; Lessons 7 and 11; Lessons 1 and 8
- Trios: Lessons 4 through 6; Lessons 2 through 4

Alignment of Learning Outcomes

The program learning outcomes for Possible Futures 2.0 are:

- A. Gain awareness of and exposure to a wide array of careers.
- B. Increase self-awareness and begin to form their potential occupational identity.
- C. Develop employability skills.
- D. Develop foundational technical skills as appropriate.
- E. Be positioned to make more informed educational choices.
- F. Transition to high school with an actionable plan for next steps.

The curriculum learning outcomes for the Health Sciences unit are:

1. Students learn the basics of first aide and health sciences.
2. Students explore career options within the health sciences industry.
3. Students identify their strengths and interests in the field of health sciences.
4. Students connect their strengths and interests in the field of health sciences to potential careers.
5. Students explore the local-labor market data and education opportunities for careers in the field of health sciences.

The Arizona Career Literacy Standards for grades 5 through 8 can be found at [this link](#).

This lesson's learning outcomes align with the program learning outcomes (PLOs), curriculum learning outcomes (CLOs), and Arizona Career Literacy Standards (CLSs) as follows:

| CLOs | Lesson Learning Outcomes | PLOs | CLSs |
|-------------|---|-------------|-------------|
| 1 | Explain the role of bones in the functioning of the human body. | C, D | 2.0 |
| 1 | Summarize the stages of how bones heal. | C, D | 2.0 |
| 1 | Review the different types of bone fractures. | C, D | 2.0 |

Tracking Completion of Lessons

If you are using SCORM Cloud or Canvas with the lessons in this unit, completion tracking options are available. If you are not using either platform, please determine if and/or how you plan to track the completion of lessons by the students.

Lesson 4 Components

Guiding Question

The guiding question is intended to provide a focal point for each lesson. This lesson's guiding question is:

- **How Do Bones Heal?**

Lesson Overview

In this lesson, students learn a standardized splinting technique, review the different types of broken bones, and learn about x-rays. This lesson also introduces the careers of x-ray technician and radiologist.

Vocabulary in This Lesson – Flip Card Activity

Students should use the flip card activity to familiarize themselves with key vocabulary terms and definitions for this lesson.

- **Immobilize:** To keep (something or someone) from moving or working; to make (something or someone) immobile
- **Supported:** To give help or assistance to (someone or something)
- **Synthesize:** To make (something) by combining different things
- **Remodeling:** To change the structure, shape, or appearance of (something)
- **Compare & Contrast:** A rhetorical style that discusses the similarities and differences of two or more things: ideas, concepts, items, places, etc.,
- **Stabilization:** To stop something from quickly changing, increasing, getting worse, etc.,
- **Secure:** Protected from danger or harm
- **Evidence:** Something which shows that something else exists or is true
- **Illustrate:** To give examples in order to make (something) easier to understand
- **Extremity:** A hand or foot—usually plural
- **Joint:** A point where two bones meet in the body
- **Splint:** A piece of wood, metal, plastic, etc., that is used to hold a broken bone in the correct position while it heals

Learning Targets

By the end of this lesson, students will be able to:

- Explain the role of bones in the functioning of the human body.

- Summarize the stages of how bones heal.
- Review the different types of bone fractures.

How Bones Heal

As the title suggests, in this section, students learn about how bones heal. They use a Rise activity to review the process starting from what happens immediately after a bone breaks to when the bone is completely healed. Students can navigate between steps by using the left and the right arrows they see on screen.

In-Person Learning Adaptation: For in-person learning, teachers can show these steps on screen.

First Responders

This section provides an overview of the process that the first responders use in the field. In this section, students will also review the steps to follow if they come upon someone with a broken arm and help is far away.

In-Person Learning Adaptation: For in-person learning, teachers can first discuss what the students would do if they came across someone with a broken arm and then reveal the steps to follow.

Splinting a Patient

Students are asked to watch the [SAM® Splint XL | SAM Medical #MoreThanSurvival](#) video to understand how to properly splint a patient. Once they watch the video, they will also see a recap of the steps they need to follow while splinting a patient. This is followed by a few knowledge check questions to which the students respond on Rise.

Now It's Your Turn!

In this section, students are asked to get creative and find materials around their home to create a splint for a family member or friend.

In-Person Learning Adaptation: For in-person learning, students can work in pairs or small groups and practice splinting each other's arms. Suggested materials: magazines, ACE bandages, or strips of fabric.

Injury Assessment

In this section, students will begin by reviewing a familiar skateboarding scenario and move on to understand the steps to be followed to perform an injury assessment at the scene of emergency. Students are asked to watch the [Assessment Techniques for Knee Joint Injuries](#) video to see some assessment techniques in action.

In-Person Learning Adaptation: For in-person learning, teachers can show the video in class and, if possible, demonstrate/simulate the assessment process.

Reading X-rays

This section provides an overview of what X-rays are and explores the allied health career of an X-ray Technician.

- Students are asked to watch the [How Dangerous Are X-Rays?](#) video to understand whether X-rays are dangerous or not.
- Students will watch the [A child's guide to hospital: Bone X-Ray](#) video to learn how X-rays are used and the role of an X-ray technician.

In-Person Learning Adaptation: For in-person learning, teachers can ask students who have had an X-ray done in the past to discuss their experiences.

Types of Fractures

In this section, students learn about how fractures are classified into different types. They navigate across the types by using the left and the right arrows they see on screen.

Students are asked to download the editable PDF document for this lesson titled “Lesson 4 - The Skeletal System - Editable PDF”. They will respond as instructed in the “**Types of Fractures**” section of the PDF. They will see the following instructions in the PDF:

“After reviewing the types of fractures, see if you can identify the different types of fractures. Type the name next to each picture. When you are finished, check your answers using the Rise lesson.”

Lesson Wrap-Up

In this section, students review the lesson summary. They will see the following information on Rise:

“EMTs have access to standardized equipment and are expected to follow a standard procedure. In many scenarios, a first responder may not have access to medical equipment, especially if an emergency occurs in the wilderness. A first responder must meet the constraints presented even if they do not have access to the best materials. During these moments, it is important to use a growth mindset to learn from each experience in the field.”

Flipgrid Activity – Let’s Talk About It

In this section, students will use Flipgrid to share their thoughts on what they learned in this lesson.

The students will see the following instructions on Rise:

“Use the Flipgrid to discuss what you learned in this lesson. Answer at least two of the following question prompts:

- What was the most interesting thing you learned in this lesson?
- What challenges do you think you would have with splinting a patient?

-
- Have you or anyone you know ever broken a bone and gotten an X-ray? What was your experience?
 - Do you think you would like to be an X-ray Technician or Radiologist?"

Remind the students to **include your class hashtag in the title of the post.**

Thinking About Your Future

At the end of the lesson, students will see the following statement on Rise: "In this lesson, you explored broken bones, splinting a patient, and X-rays."

Before moving on to the next lesson, think about the following questions:

- Which careers that you explored today do you find the most interesting?
- How did you enjoy learning about splinting?

Career Pathways

At the end of each lesson, students will be reminded that it is never too soon to start exploring future career options! Encourage students to check out this resource to help them learn about:

- Various jobs in the Allied Health Sciences field
- Projected growth
- Potential earnings

Students can access the resources at this link: [Pipeline AZ Career Search](#).

Lesson Completion

At the end of the lesson, students will see the following message on Rise:

"In future lessons, you will learn more about different aspects of the health sciences field. Topics will include exploring the emergency room, blood and the human body, and the skin."

Extended Activity – How Bones Heal Graphic Organizer

Teachers can also consider conducting an additional activity in class by providing the following instructions:

"Unlike machines, our bodies can repair themselves. The next video will help us learn about how bones heal. Focus on the function of each stage if some of the vocabulary is new. As you

watch the video, be sure to record the functions of each in the How Bones Heal Graphic Organizer.

| Stages | Functions |
|--|--|
| List the four stages of the regenerative process in order. | Describe the function of each stage. (In other words, what is the body doing at each stage?) |
| 1. | 1. |
| 2. | 1. |
| 3. | 1. |
| 4. | 1. |

1. Watch <https://askabiologist.asu.edu/bone-healing>
2. Stop the video at each stage so you can fill out your graphic organizer.
 - a. Day 1: Blood clot (0:35)
 - b. Day 7: Soft Callus (1:15)
 - c. Day 28: Hard Callus (1:37)
 - d. Month 3: Remodeling (1:39)

Now that you know how bones heal, why would we splint broken bones? Cast them?"