

# MAKE A GOLDEN RECORD

Grades 4-8, Day 2

## MAKE YOUR GOLDEN RECORD & FLY YOUR DRONE

### WELCOME

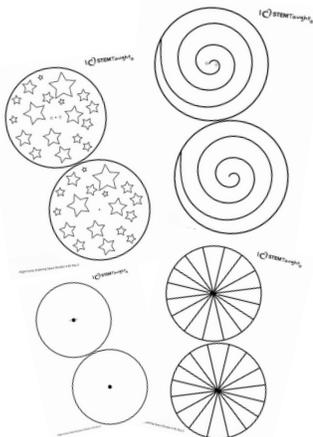
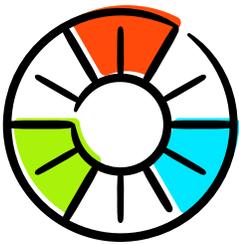
(5 min)

### STEM CRAFT

(40 min)

#### Materials:

- Paper spinner template
- Cardboard backing (or cardstock spinners)
- Scissors and string
- Glue stick
- Coloring utensils



**Introduction:** Welcome your students. Be friendly.

### CHRISTMAS PAPER SPINNER EXPLORATION

Say: **Today we will learn about the Voyager's Golden Record, a spinning disc full of sounds and messages from Earth. Today, we're making our own spinning disc—called a paper spinner.**

Watch this tutorial to get an idea of the activity:

**Easy Paper Spinners - STEAM Color Theory (Paper Crafts)**

<https://www.youtube.com/watch?v=bZ8PShMOXps>

1. Students work in groups and cut out the paper spinner template. They can use the templates or choose a blank one to modify.
2. They color their spinners using festive colors, polka dots, stripes or anything they like. Encourage students use rulers, draw, and choose colors they think will blend together.
3. Trace the circle shape and cut out a piece of cardboard. You can use the material box. Glue both circles to the cardboard.
4. Cut yarn or thick string, about 15 inches is good.
5. Help students poke holes through the disc and thread yarn through both the holes, then tie a knot.
6. Students hold the string with a small loop around their ring finger and pinch the string with their pointer finger and thumb. They take turns to swing the spinner in small circles to get the spin going and watch their amazing creations. Encourage them to experiment:
  - How does spinning faster or slower affect how long it spins?
  - What happens if you pull the yarn unevenly on one side?
  - What happens if you hold the spinner closer to or farther from your hands? What happens to the colors when it spins?
  - What could you change about your design if you made this again?



## READER'S THEATER

(30-40 min)

### Materials:

- Copy of Day 2
- Three pairs of scissors
- One roll of tape



## Read Voyage Through the Galaxy (Reader's Theater)

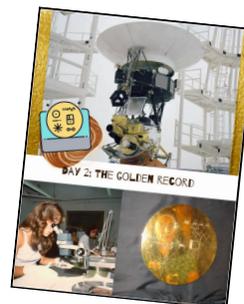
Read Day 2 of "Voyage Through the Galaxy" with your students. Talk about the story and let volunteers act out their parts.

**Prepare beforehand:** Get a copy of "Day 2." Get scissors and tape.

### What you'll do:

#### 1. Setup storytelling props (10 min):

- Call up volunteers to help with the reader's theater. Ask students to cut out the story props found in the story document.
- Assign a volunteer actor to handle each prop for story time.
- Read the story to your students. Guide your volunteer prop holders in following the acting instructions written in red and behind the props as you read.
- Discuss the story with your students following the discussion question prompts printed underneath the story text.

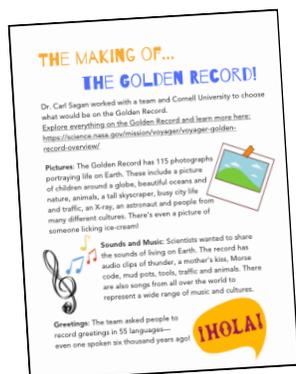


## STEM RESOURCE

(30 min)

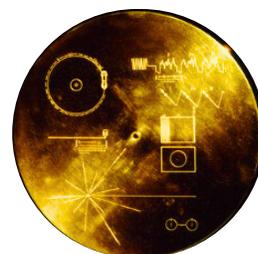
### Materials:

- Get printout: The Making of the Golden Record



## LOOK INSIDE: THE GOLDEN RECORD

Read 'The Making of' to your students. Follow this link to listen to the sounds that are actually on the Golden Record with your students. Play examples of sound clips. Call on volunteers to share what they like best.



### NASA Sent This Message: Voyager's Golden Record

<https://www.youtube.com/shorts/MT-ErptvDmg>

### Voyager Golden Record

<https://open.spotify.com/playlist/6pcuzwZSlw7OgL149bgJmZ>

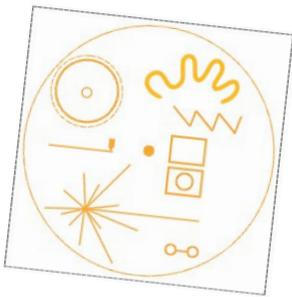


## STEM CRAFT

(30 min)

### Materials:

- Student sheets
- Gold glitter
- Glue
- Scissors



## STEM CRAFT

(30 min)

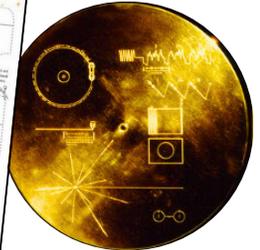
### Materials:

- Drawing utensils
- Worksheet: My life on earth

## MAKE YOUR OWN GOLDEN RECORD!

**Objective:** Students use glue and gold glitter to decorate their golden record artwork. They Also complete an “All about me” page to show what life on Earth is like.

Say: **Today you get to make your own Golden Record. I will play a song mixed with things that is actually on the Golden Record as we work. You are doing a very important task deciding how to tell the story of our planet. I can't wait to see your fun choices!**



Play this video to show what some of the images and sounds are like on the golden record.

**The Voyager Golden Record Remixed - Symphony of Science**

<https://youtu.be/L6zulqXLPuW?t=15>

### What you'll do:

1. Play background sounds from the Spotify link above. The complete playlist is about 1 hour 45 minutes. You can shuffle and choose songs as you like. Students may enjoy knowing the record also includes rock and roll!
2. Students cut out their golden record and cover from the “Golden Record” handout.
3. Students create artwork to design their cover for the record. Help them put glue on the record and add glitter.
4. Students take their record covers outside. Prompt them to notice how the golden glitter catches the sunlight.  
Say: **“Your record is shining because the small pieces of golden glitter have a shiny surface that reflects light. Gold is special because it stays shiny and never gets rusty—it stays gold forever!”**

## DRAW IMAGES FOR THE GOLDEN RECORD!

**Objective:** Students draw the images that they think are most representative of life on earth.

### What you'll do:

1. Students brainstorm in groups to think of what images they would want to draw for the golden record to represent life on earth, then they draw individually.



## MINI-FLIER

(60 min)

### Materials:

- Mini-fliers



## RELAY RACE TO THE END OF THE GALAXY

**Say:** Today we are going to take our mini fliers on a relay race across the galaxy just like the voyager probes.

**Game prep:** Split students into teams. Each team will need their own mini-flier.

Create one path per team, placed parallel so teams can race together. Indicate the starting spot, end spot and where team members will pass off the hover ball and have their team spread out across this path.

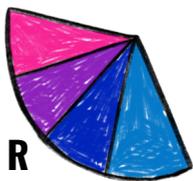
### Instructions:

1. Give students the mission brief. Say: **This is a relay race through space: each teammate will take turns catching and tossing the mini-flier from one team member to the next.**
2. When you say "Go!", the first player flies the hover ball from Earth to the first planet. The next teammate passes it forward. Chase after it if the mini-flier flies off!
4. The relay continues until the final teammate makes the flying ball reach all the way to the edge of the galaxy.
5. The first team to reach the edge of the galaxy wins! You can play additional rounds.

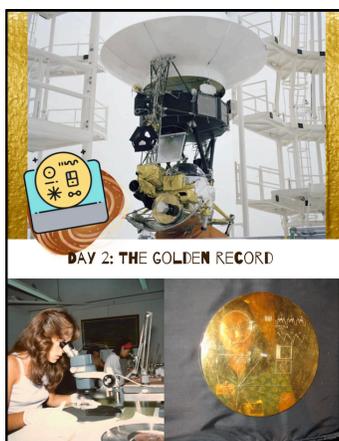
**Explain:** **Your team's mission depended on working together and passing the mini-flier carefully to go farther than ever before. The ambitious nature of the Voyager mission was also a space adventure powered by teamwork and collaboration!**



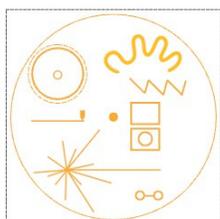
## PAPER SPINNER EXPLORATION



## READER'S THEATER



## GOLDEN RECORD EXPLORATION



### METRIC

#### 3-PS2-2.

Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

#### 4-PS3-1.

Use evidence to construct an explanation relating the speed of an object to the energy of that object.

#### 5-PS2-1.

Support an argument that the gravitational force exerted by Earth on objects is directed down. *(Students begin to see how the Voyagers must overcome gravity and travel at high speed.)*

#### 3-5-ETS1-2.

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. *(Students see how NASA scientists designed Voyager, as well as the Golden Record, to survive extreme temperatures and communicate across billions of miles, applying problem-solving and design constraints.)*

#### 3-5-ETS1-3.

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. *(Students role play as engineers to test insulation, power sources, and antennas, showing how iterative testing and evaluation improve a design.)*

#### 3-PS2-2.

Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

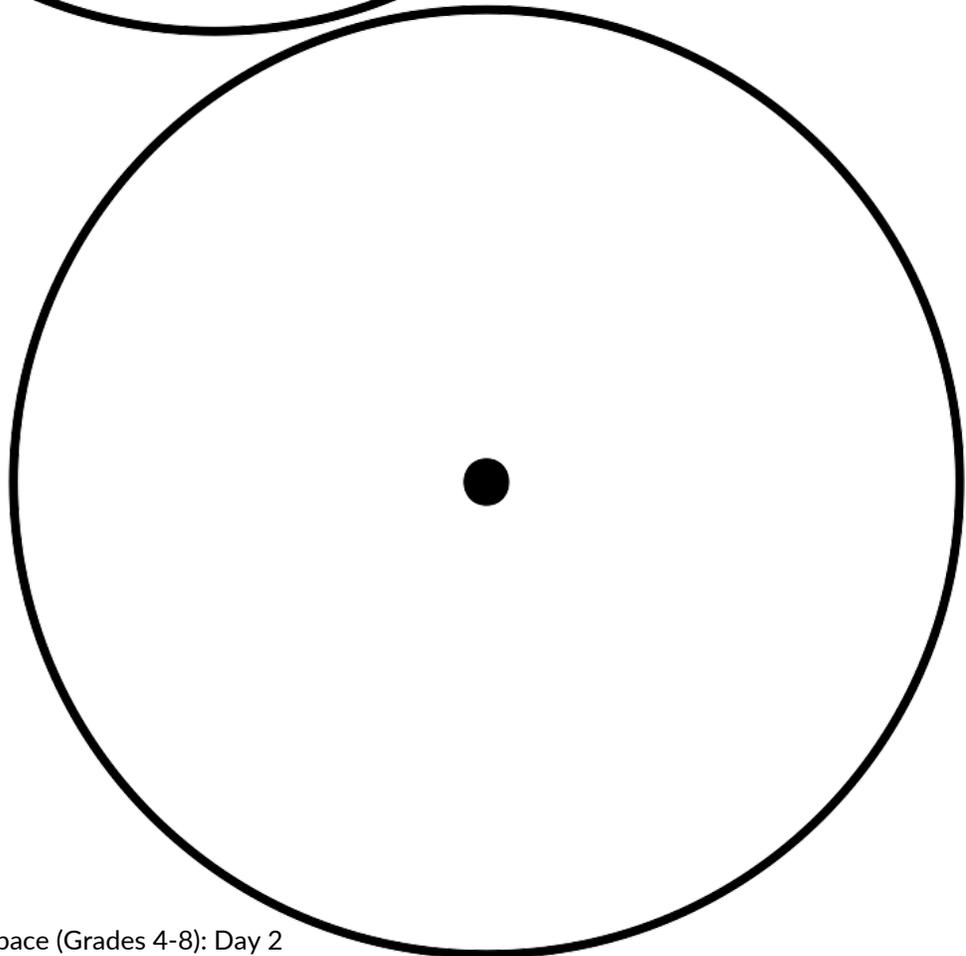
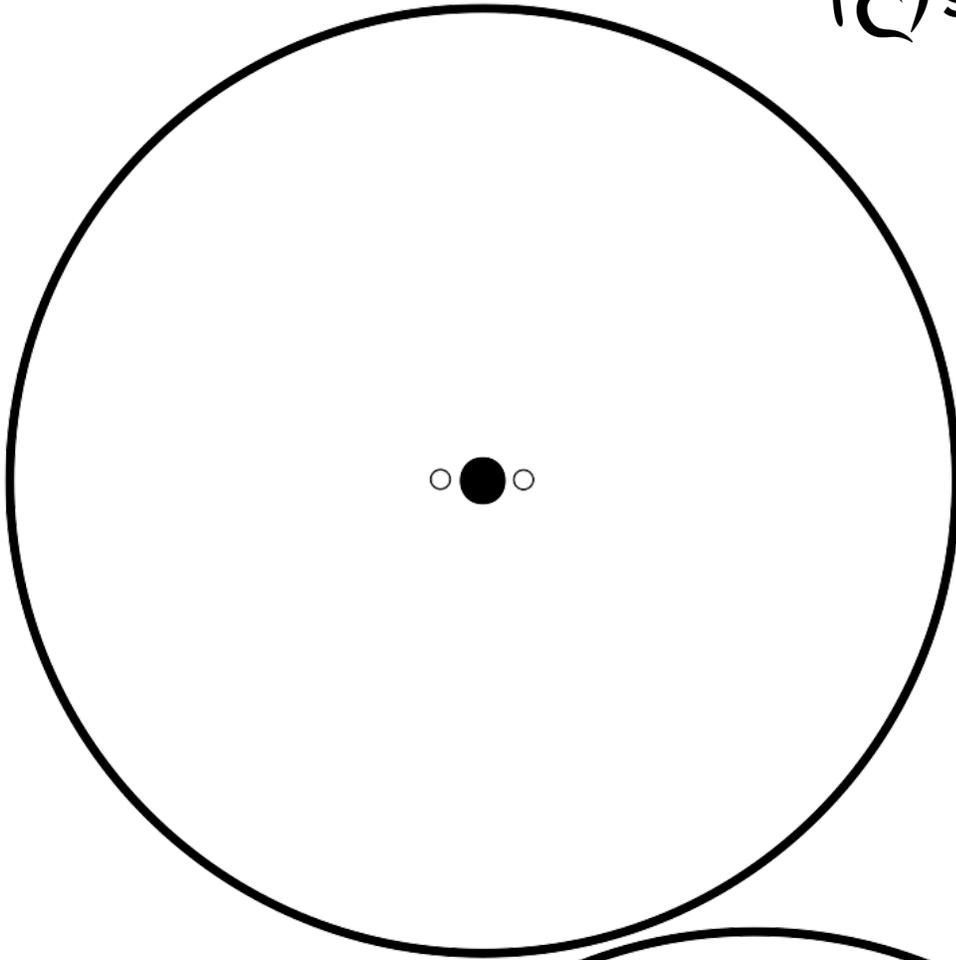
#### MS-PS4-2.

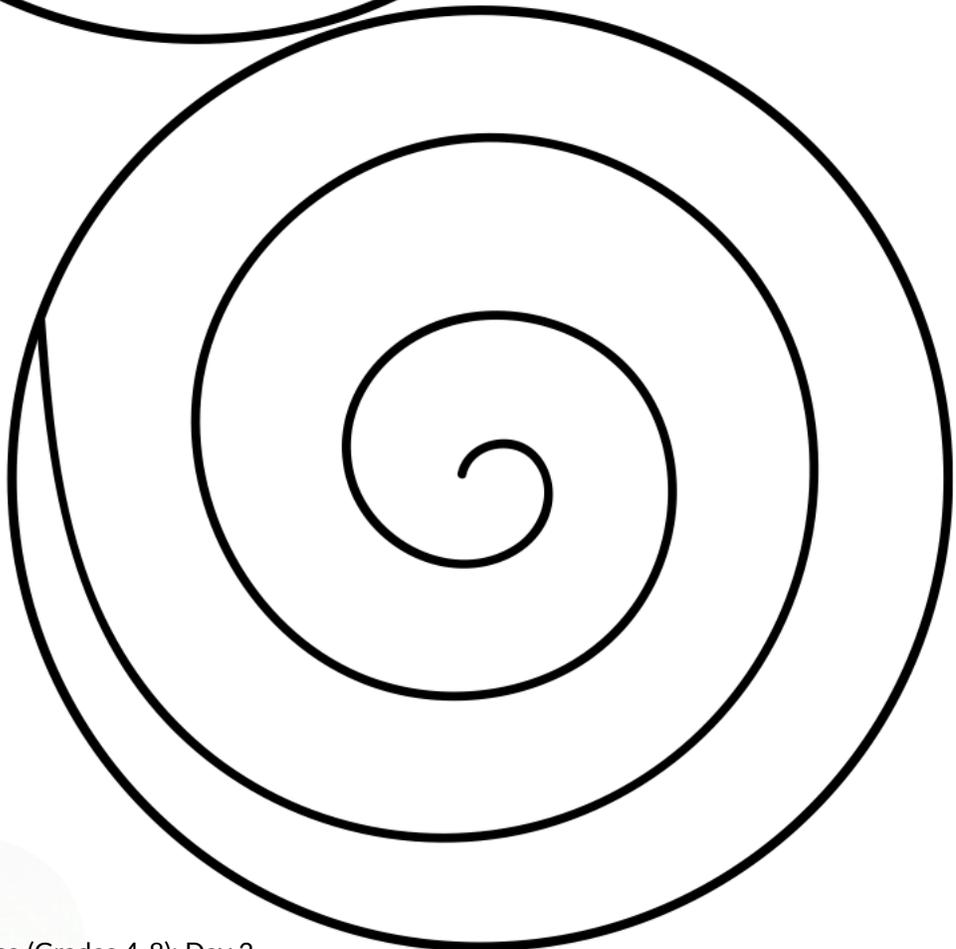
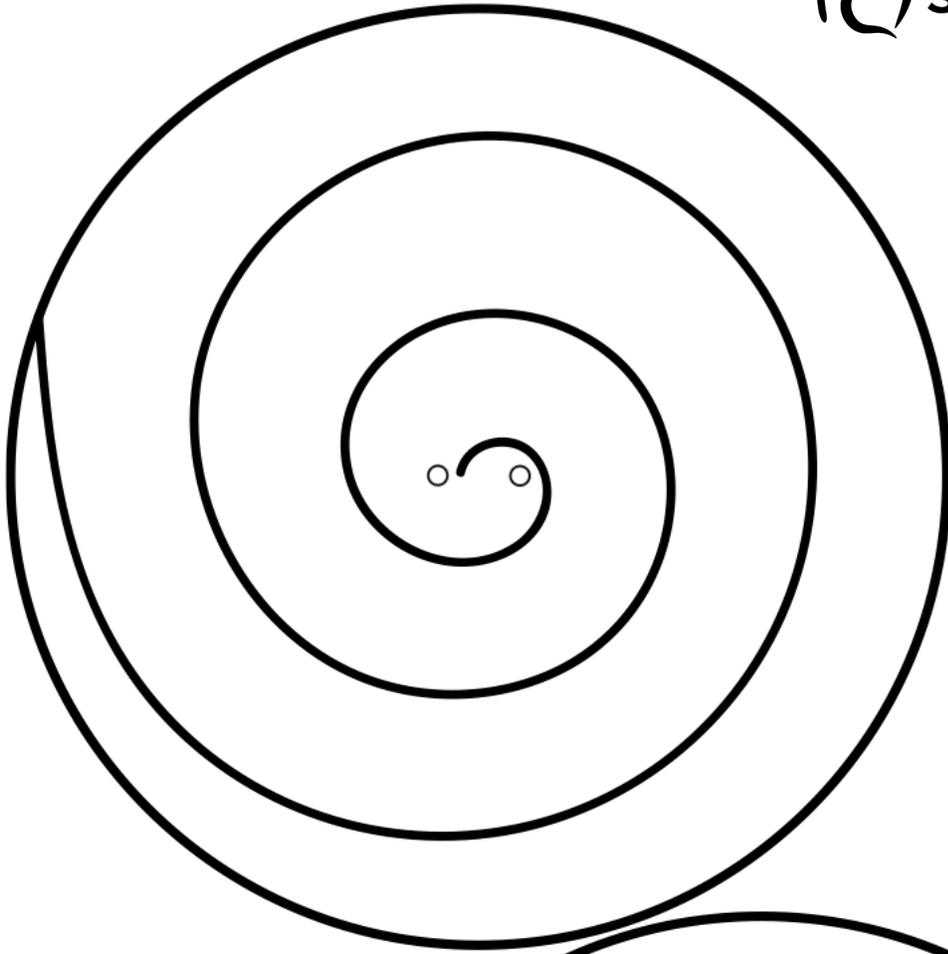
Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. *(Students learn that the Golden Record stores sounds, building on their understanding of waves as they consider how materials reflect, absorb, or transmit them.)*

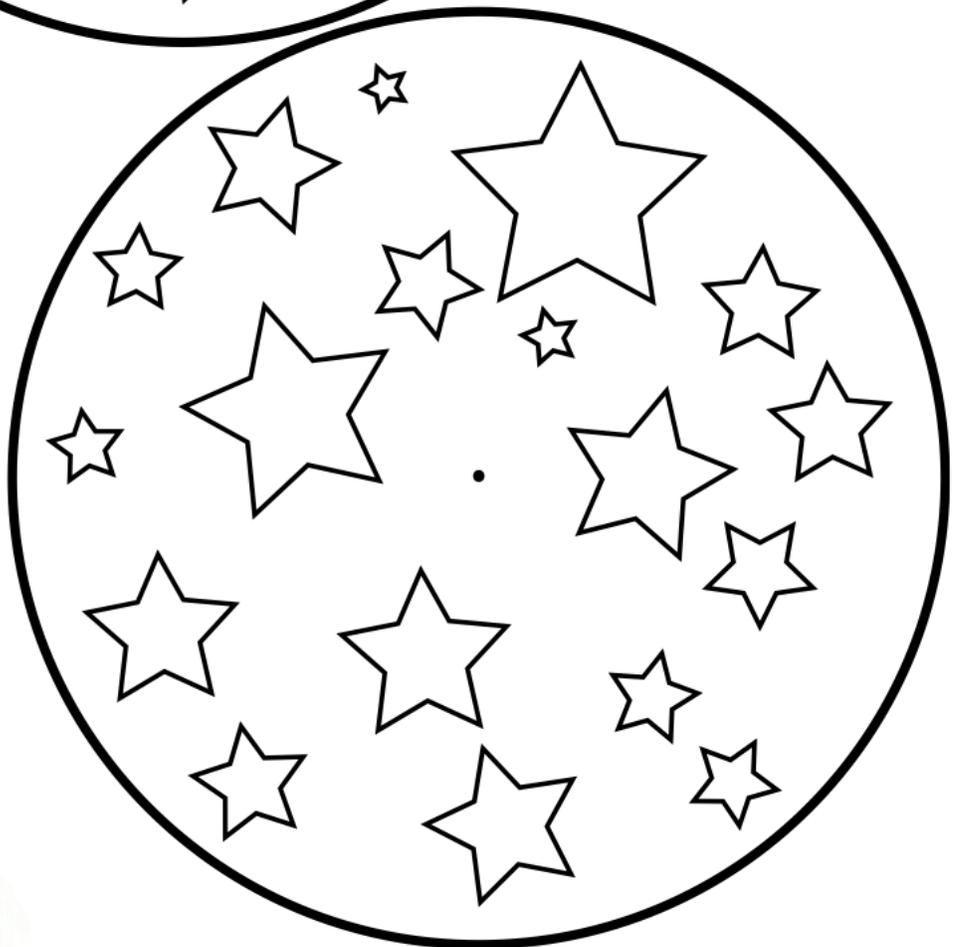
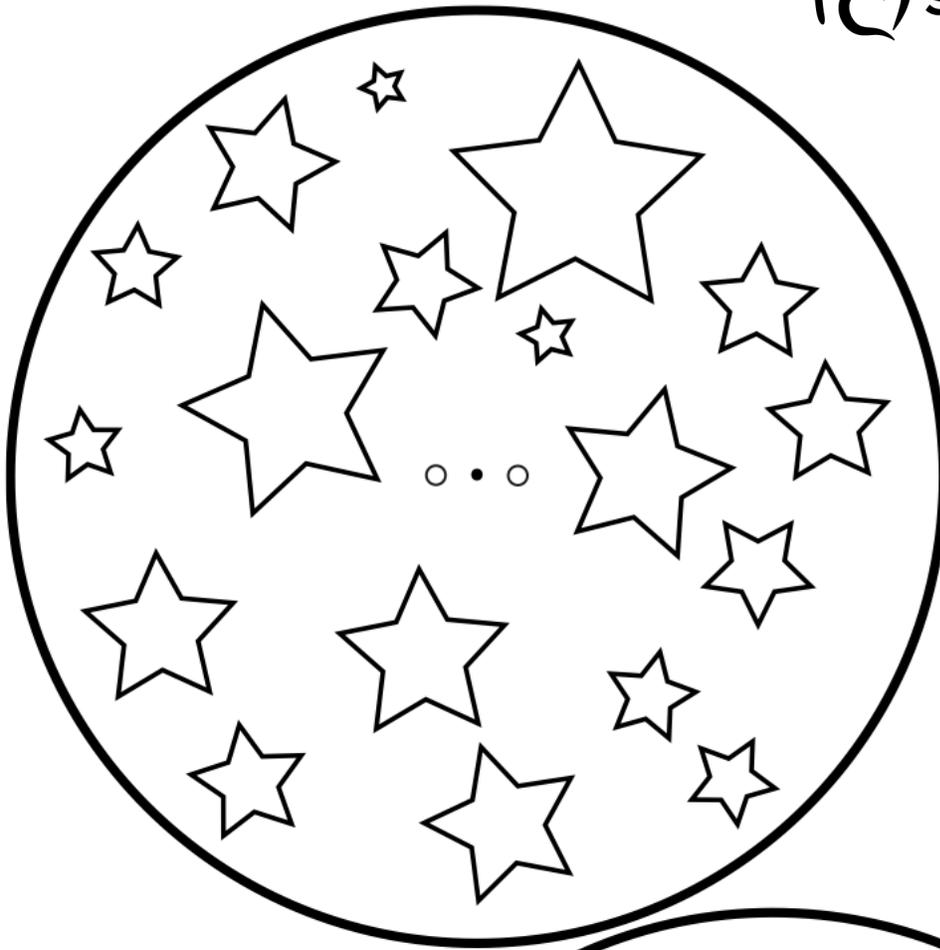
#### 3-5-ETS1-2.

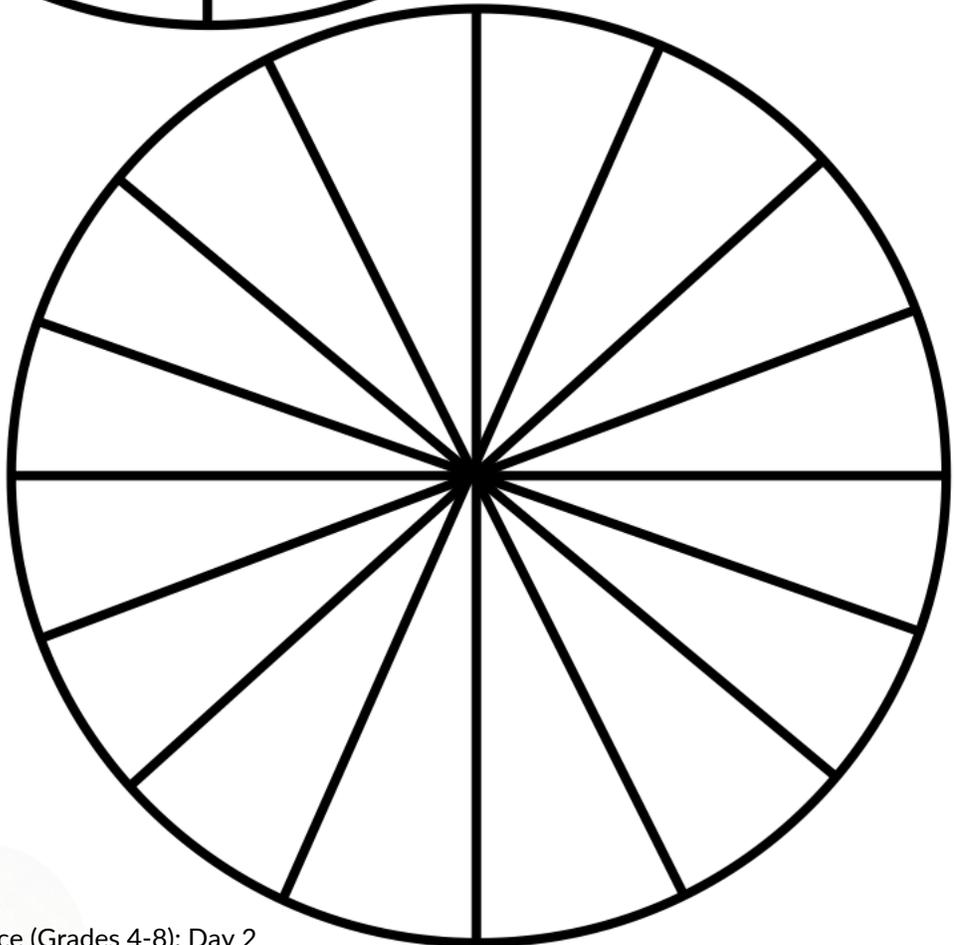
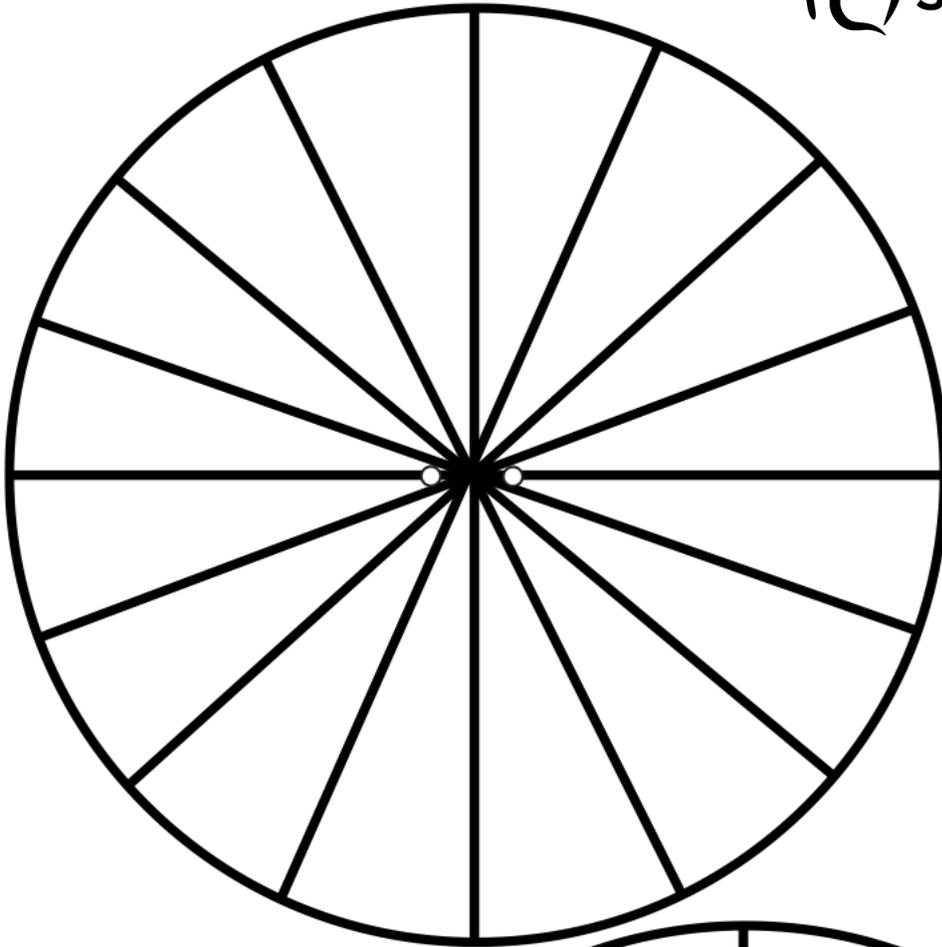
Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. *(Students decide what they would like to include and rationalize their choices.)*











# STEM COACH SHEET: MAKE YOUR OWN GOLDEN RECORD!

## Summary:

Students work in groups to make their own list of the pictures, sounds, greetings and songs they would include in their Golden record. Students discuss the reasoning behind their choices.

## What you'll do:

Say: **We are creating our own Golden Record to launch into space. Who knows what kind of life forms might end up finding it, many centuries later? We don't know what language they might speak. Think about how you will greet them. Does anyone know any other languages?** Tell students the Record has limited space. Students work in their groups to draw pictures that show life on Earth. Students choose sounds that will give the non-Earth life forms an idea of what it's like to live on our planet. Play the songs and sound clips from the Voyager Golden Record as they work.

## Tips:

- Prompt students to choose some music and pictures they feel would help other life forms explore and discover our planet.
- Circulate to make sure students are contributing equally in the group discussion and diverse ideas are being heard. This is an excellent opportunity for multilingual learners to celebrate and share their customs and traditions.
- Encourage students to think out of the box and share their thought process.

*If some life form, far away in the galaxy, were to find this record millions or even billions of years later, what would we want them to know about Earth?*

# THE MAKING OF...

## THE GOLDEN RECORD!

Dr. Carl Sagan worked with a team and Cornell University to choose what would be on the Golden Record.

Explore everything on the Golden Record and learn more here:

<https://science.nasa.gov/mission/voyager/voyager-golden-record-overview/>

**Pictures:** The Golden Record has 115 photographs portraying life on Earth. These include a picture of children around a globe, beautiful oceans and nature, animals, a tall skyscraper, busy city life and traffic, an X-ray, an astronaut and people from many different cultures. There's even a picture of someone licking ice-cream!



**Sounds and Music:** Scientists wanted to share the sounds of living on Earth. The record has audio clips of thunder, a mother's kiss, Morse code, mud pots, tools, traffic and animals. There are also songs from all over the world to represent a wide range of music and cultures.

**Greetings:** The team asked people to record greetings in 55 languages—even one spoken six thousand years ago!

**Sumerian:** "Išme šum-ma ina šulmu ittī-ka."  
(Translation: "May all be well with you.")

**IHOLAI!**



Many people worked together to make the golden records. Because of the materials they chose, the records have a half life of over 4 billion years! Only eight copies were made, including the two we carry in space! Finally, the records were brushed with a thin layer of real gold and ready for an exciting journey!



# Voyager's Golden Record

## Objective:

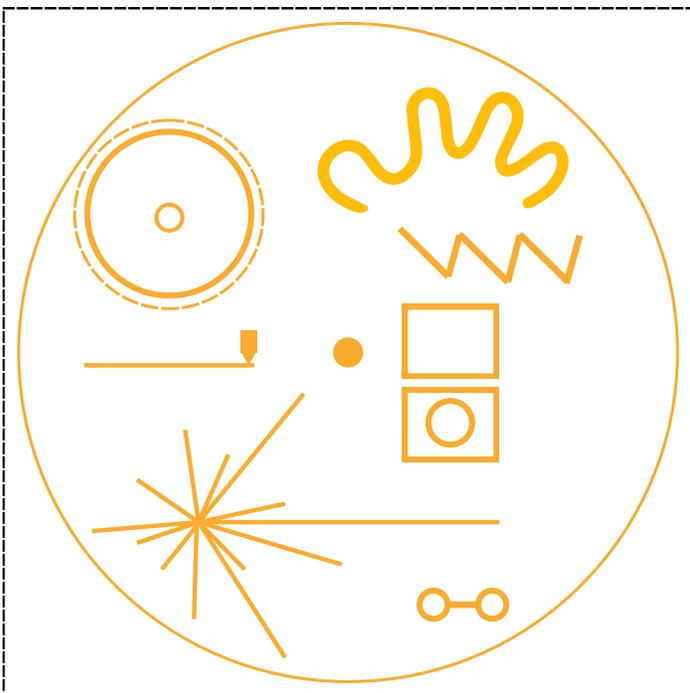
Make Voyager's golden record and design a record cover for it.

## What you'll do:

1. **Cut on the dotted lines** to cut out the record and record cover.
2. **Create artwork and a design** on the record cover.
3. **Fold the tabs and glue** to make your record cover.
4. **Put glue on the record and add gold glitter.**
5. **Take your glitter record outside.** Notice how the golden glitter catches the sunlight. Gold is special because it stays shiny and never gets rusty—it stays gold forever!"

Fold on solid lines.

Cut on dotted lines.



# Voyager's Golden Record

## MY LIFE ON EARTH

Draw pictures to summarize what life on Earth is like. Will you draw beaches, cute animals, and mountains? How about your family? Think of all the things that make living on Earth so special for you and draw them!

