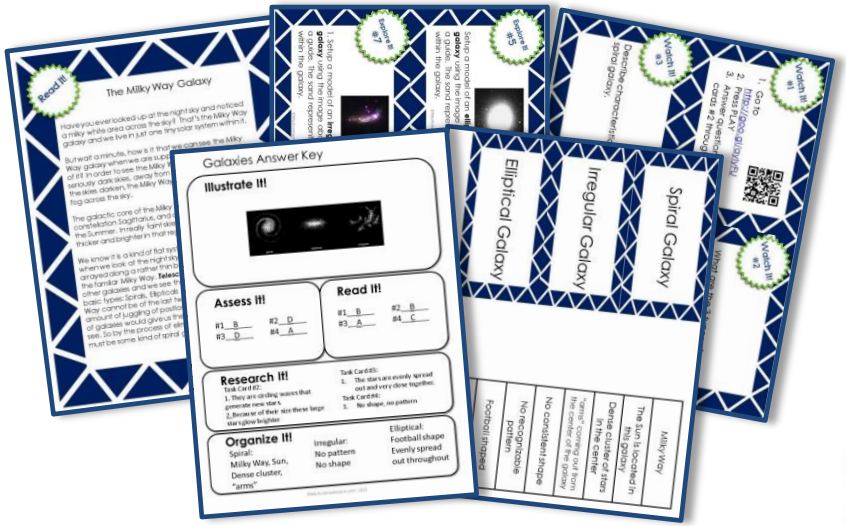
Mad Science Station Labs: Galaxies



8 Plug & Play Science Stations

Mad Science Station Lab – Galaxies – Teacher Directions

Explore It! – I will spend much of my time at this station making sure that the students are building the models correctly. You will need 3 plates with a scoop of sand on each of them. These will be used for making the 3 types of galaxies. You will also need a way to label the Sun in the spiral galaxy. I would used a toothpick, piece of tape and tiny ball of clay to make it stand up.

Illustrate It! – You will need to set out map colors and markers at this station.

Read It! – Print several different copies (I use 6) of the reading passage so that multiple students can read at different paces

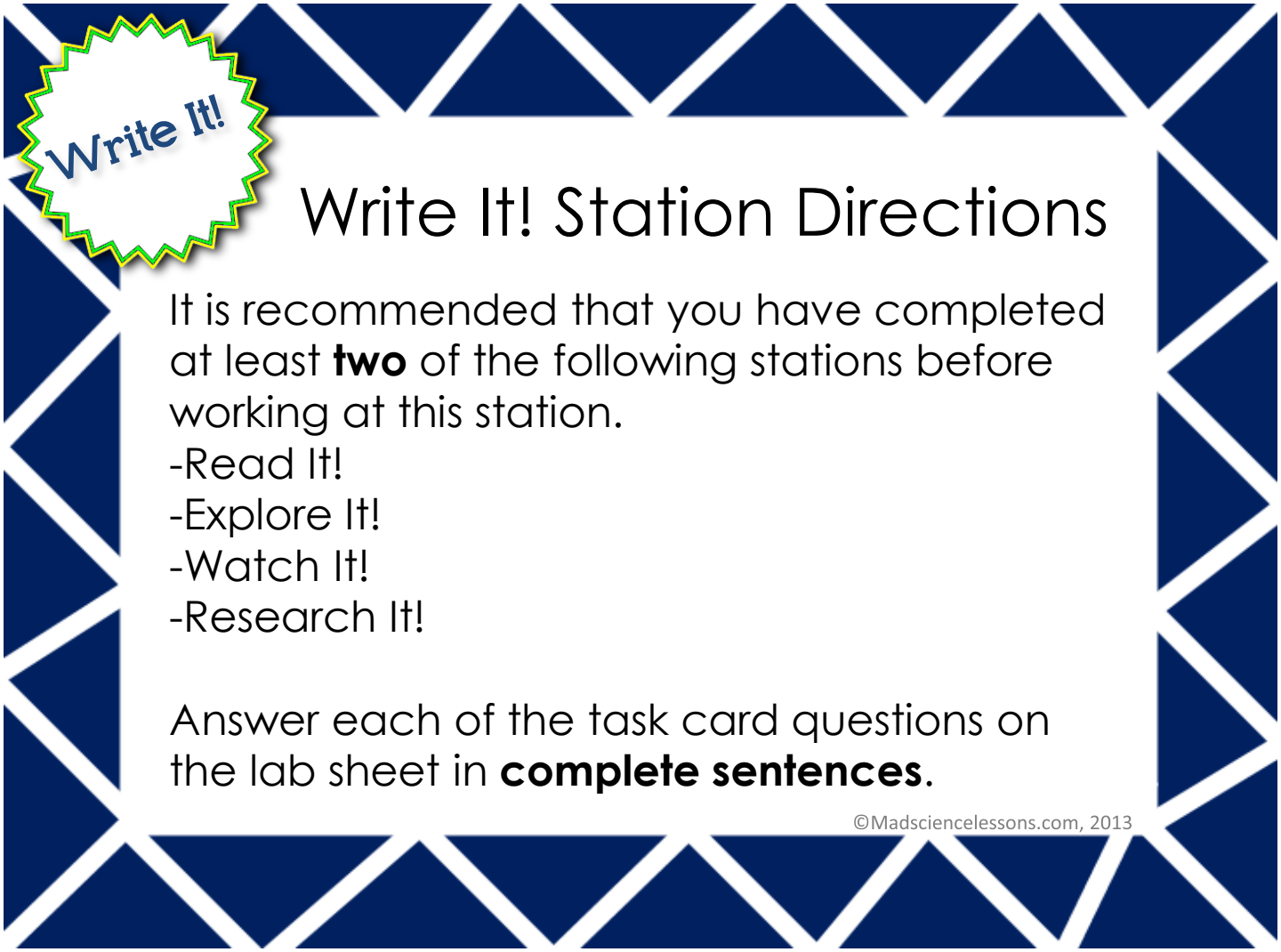
Watch It! – The video is on my Google Drive and is case-sensitive, but you can also find it on YouTube https://www.youtube.com/watch?v=IXTgYU71ufY

Organize It! – The cards for this activity are attached near the end of this file. Print several sets and then just put them in the basket for kids to pull from. This is a good one for later in the week to demonstrate mastery too! Students should be encouraged to do the Research and Explore station before attempting this one.

Write It! – Students should be encouraged to do the Research and Explore station before attempting this one.

Research It! – The goo.gl link on the task card is case-sensitive. The original link is http://www.kidsastronomy.com/galaxys.htm

Assess It! – Students should be encouraged to do the Research and Explore station before attempting this one. If I grade anything I usually take a close look at the answers from this station.



Write It! Station Directions

It is recommended that you have completed at least **two** of the following stations before working at this station.

-Read It!
-Explore It!
-Watch It!
-Research It!

Answer each of the task card questions on the lab sheet in **complete sentences**.

Write It! #1

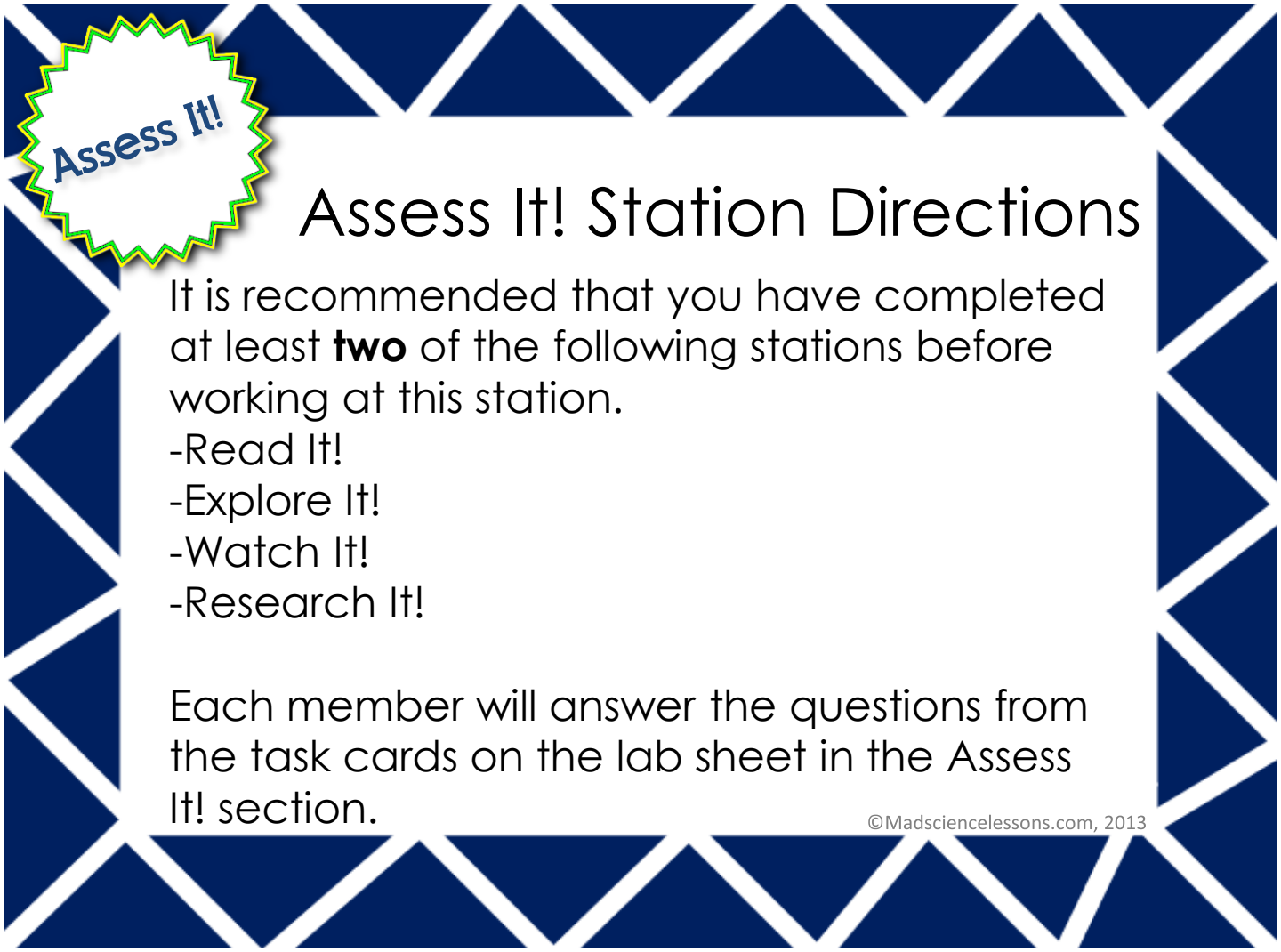
In your own words explain the difference between, **spiral, elliptical,** and **irregular-shaped** galaxies.

Write It! #2

Describe where the sun is located in our disc-shaped galaxy, the Milky Way.

Write It! #3

Describe Earth's distance to the Sun compared to other stars in our galaxy.



Assess It! Station Directions

It is recommended that you have completed at least **two** of the following stations before working at this station.

-Read It!
-Explore It!
-Watch It!
-Research It!

Each member will answer the questions from the task cards on the lab sheet in the Assess It! section.

Assess It! #1

Which galaxy is represented in the image above?

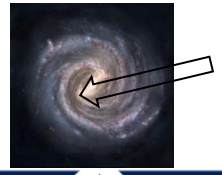
A. Irregular galaxy
B. Spiral galaxy
C. Elliptical galaxy
D. Electromagnetic galaxy

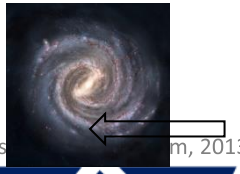
Assess It! #2

Which image best represents the location of the Sun in the Milky Way galaxy?

A. 

C. 

B. 

D. 

Assess It! #3

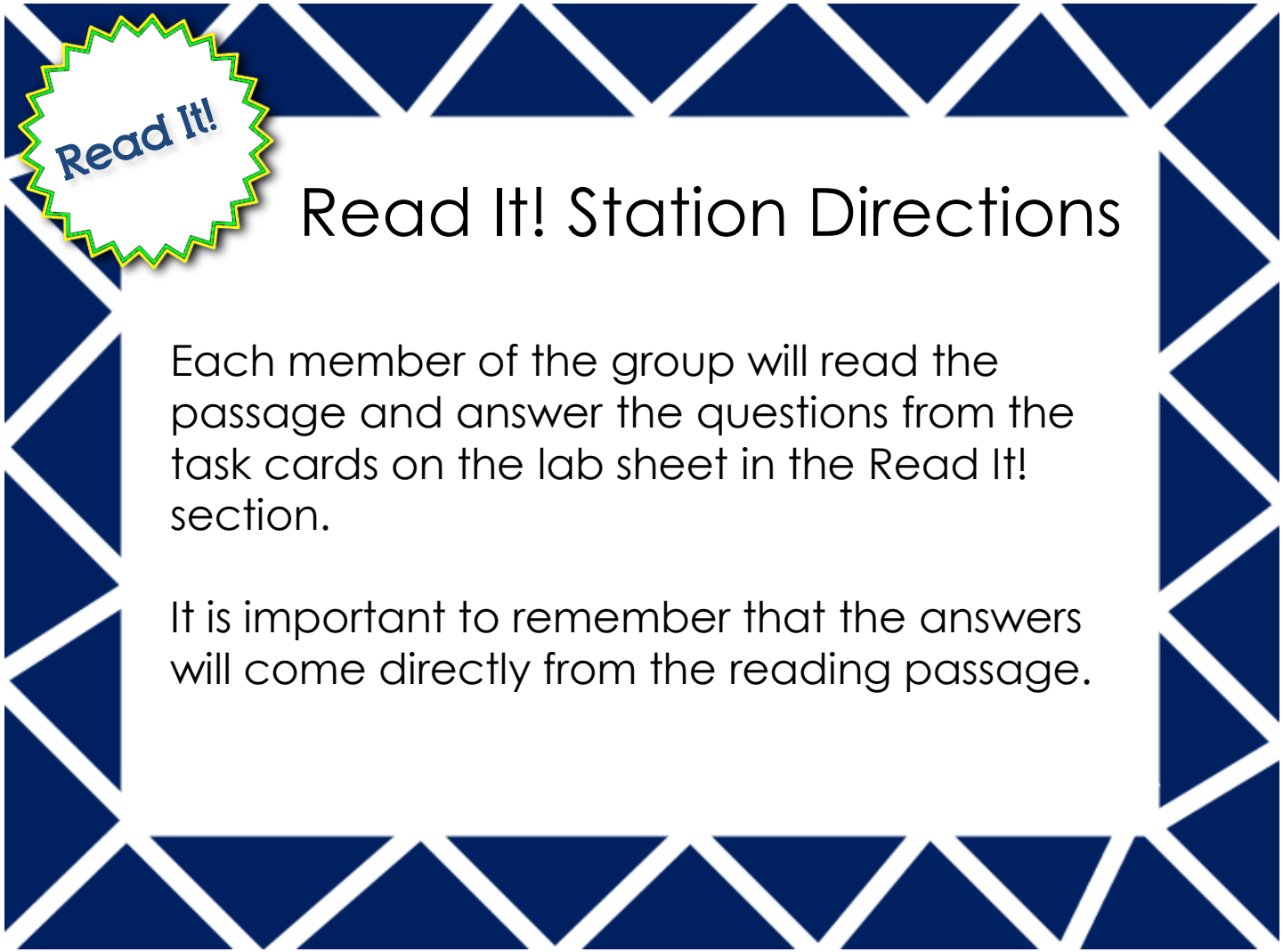
What are the names of the 3 types of galaxies?

A. spiral, elliptical, electromagnetic
B. spiral, irregular, electromagnetic
C. elliptical, obtuse, irregular
D. spiral, elliptical, irregular

Assess It! #4

Which of the components of the universe best describes a system of stars, gases and dust held together by gravity?

A. Galaxy
B. Planet
C. Comet
D. Solar system


Read It!
Read It! Station Directions
Each member of the group will read the passage and answer the questions from the task cards on the lab sheet in the Read It! section.
It is important to remember that the answers will come directly from the reading passage.

Read It!

The Milky Way Galaxy

Have you ever looked up at the night sky and noticed a milky white area across the sky? That's the Milky Way galaxy and we live in just one tiny solar system within it.

But wait a minute, how is it that we can see the Milky Way galaxy when we are supposed to be living inside of it? In order to see the Milky Way at all, you need seriously dark skies, away from the light polluted city. As the skies darken, the Milky Way will appear as a hazy fog across the sky.

The galactic core of the Milky Way is located in the constellation Sagittarius, and only really visible during the Summer. In really faint skies, the Milky Way is clearly thicker and brighter in that region.

We know it is a kind of flat system of stars because when we look at the night sky, the Milky Way's stars are arrayed along a rather thin band across the sky to form the familiar Milky Way. ***Telescopically***, we can study other galaxies and we see that they come in three basic types: Spirals, Ellipticals and Irregulars. The Milky Way cannot be of the last two categories because no amount of juggling of position of the Sun in these types of galaxies would give us the kind of night sky that we see. So by the process of elimination, the Milky Way must be some kind of spiral galaxy.

Read It! #1

In the fourth paragraph the word telescopically means?

A. To communicate via phone
B. To use a telescope
C. To view close distances
D. To see without a device

Read It! #2

What would be another good title for this passage?

A. The Three Types of Galaxies
B. Our Home Galaxy: The Milky Way
C. Different Galaxies in the Universe
D. The Universe Around Us

Read It! #3

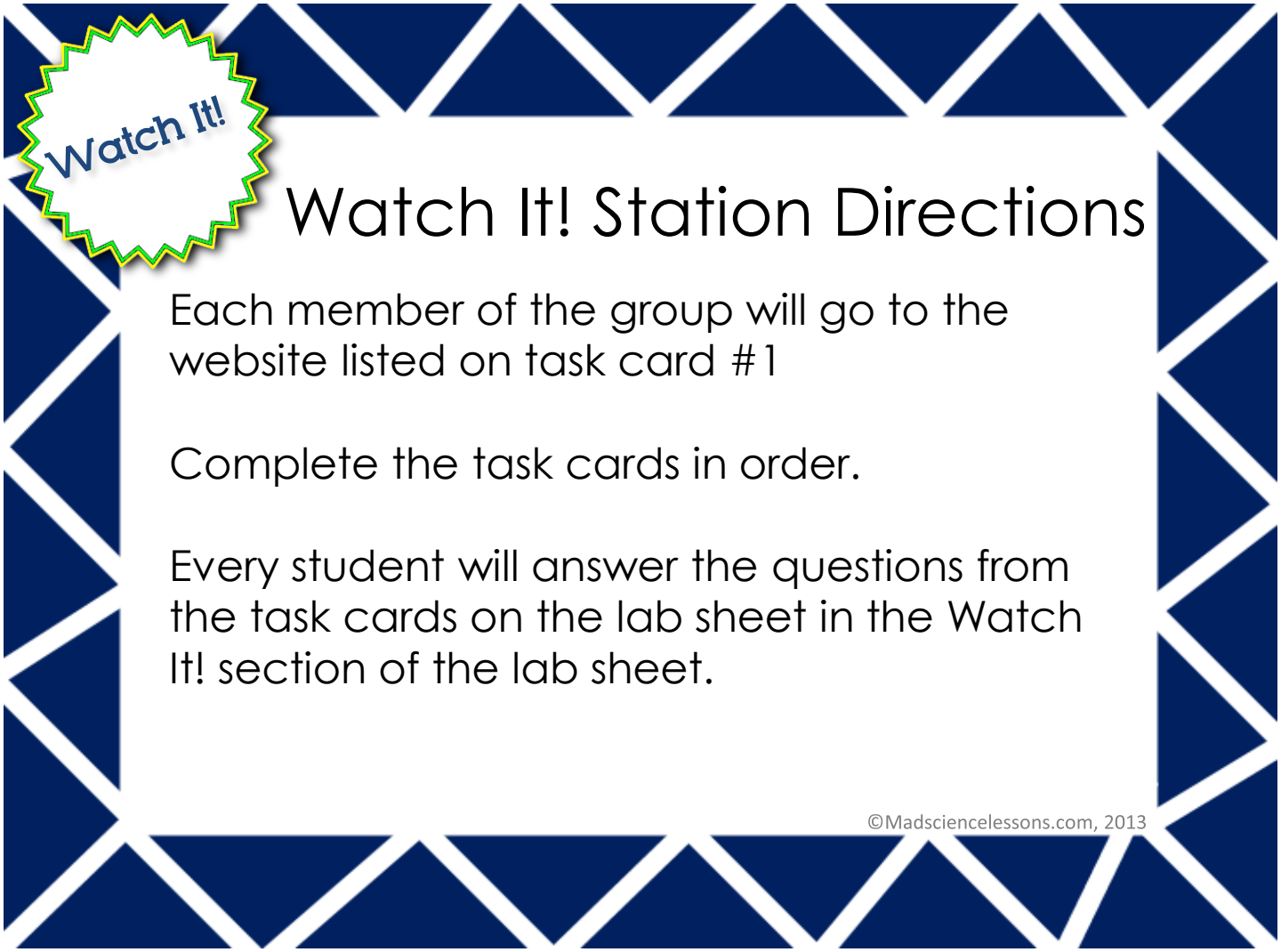
In what season can you most likely see the galactic core from the United States?

A. Summer
B. Fall
C. Winter
D. Spring

Read It! #4

According to the passage, how do we know we live in a spiral galaxy?

A. Because we can see it from the outside
B. Life on other galaxies has told us
C. The night sky aligns with other galaxies in the universe that we know are spiral
D. Because the stars are equal distance apart


Watch It!
Watch It! Station Directions
Each member of the group will go to the website listed on task card #1
Complete the task cards in order.
Every student will answer the questions from the task cards on the lab sheet in the Watch It! section of the lab sheet.
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Watch It! #1

1. Go to "Types of Galaxies" on the flashdrive
2. Answer questions on cards #2 through #4

Watch It! #2

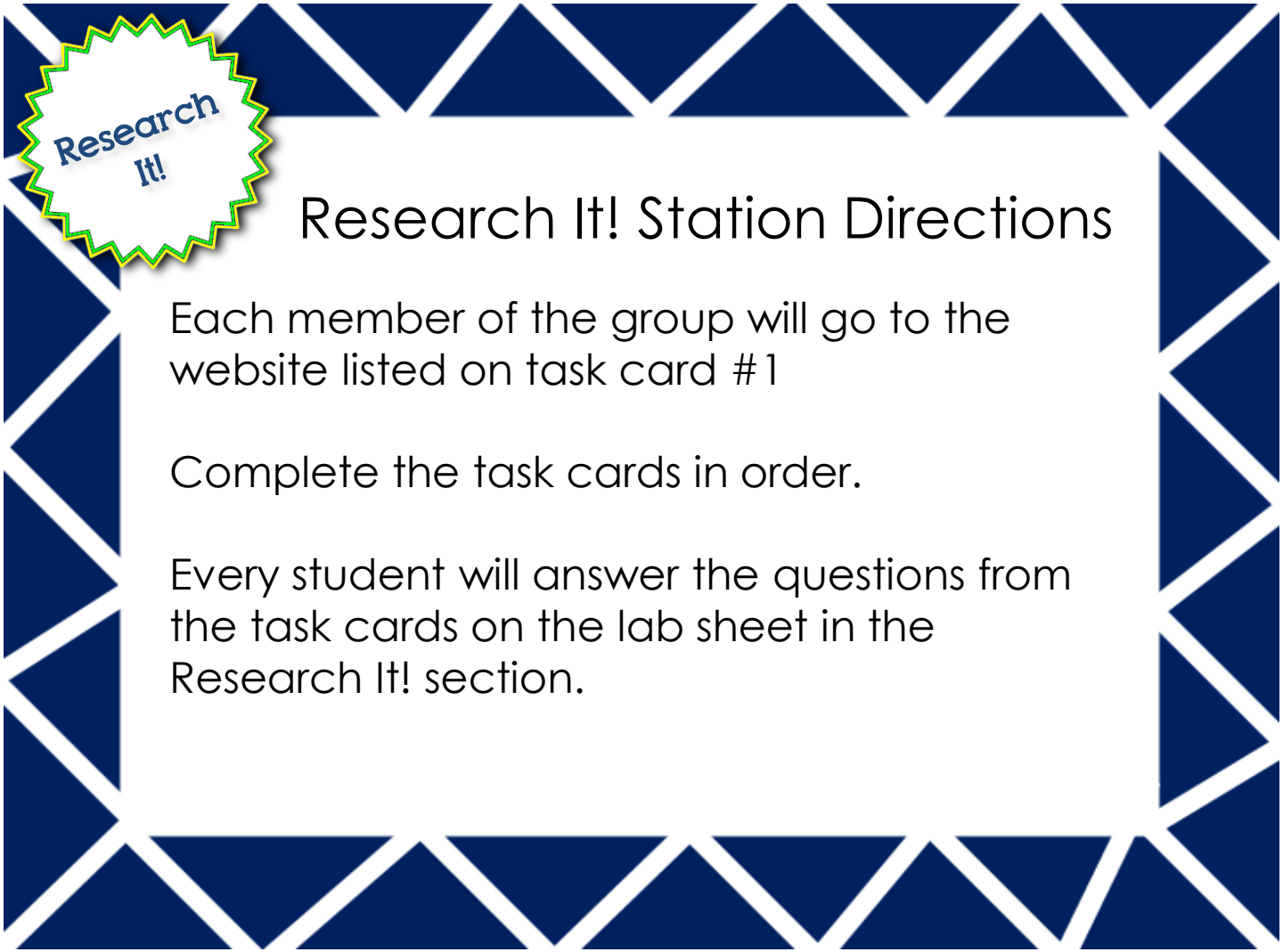
What are the 3 types of galaxies?

Watch It! #3

Describe characteristics of a spiral galaxy.

Watch It! #4

What is the type of galaxy that has no defined pattern or shape?



Research It! Station Directions

Each member of the group will go to the website listed on task card #1

Complete the task cards in order.

Every student will answer the questions from the task cards on the lab sheet in the Research It! section.

Research It! #1

1. Go to http://www.kidsastronomy.com/galaxys.htm
2. Read the entire article

Research It! #2

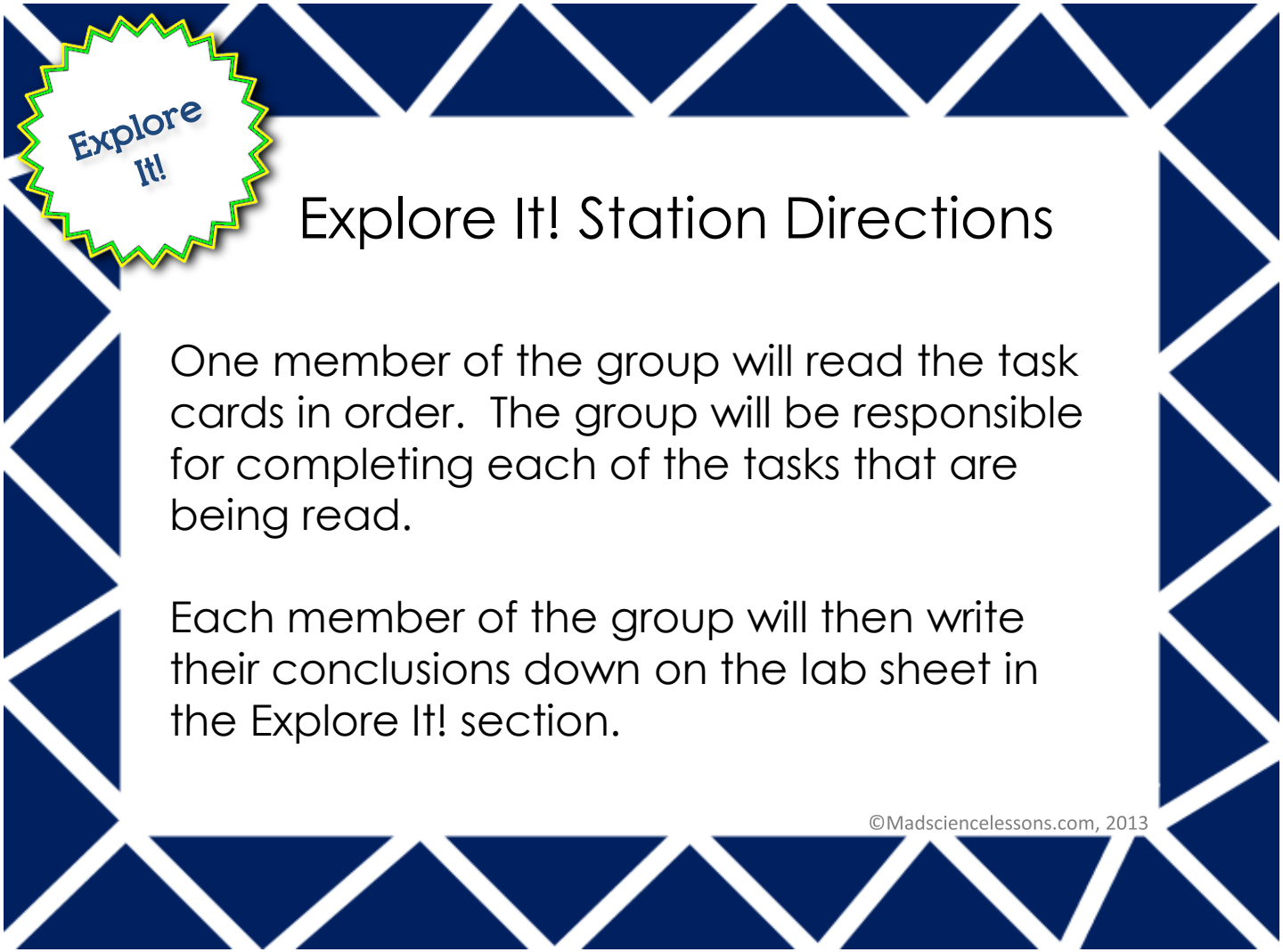
1. Where do the spirals come from?
2. What causes the waves to glow?

Research It! #3

1. Why does an elliptical galaxy look like one giant star?

Research It! #4

1. What are two characteristics of irregular shaped galaxies?


Explore It!
Explore It! Station Directions
One member of the group will read the task cards in order. The group will be responsible for completing each of the tasks that are being read.
Each member of the group will then write their conclusions down on the lab sheet in the Explore It! section.
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Explore It! #1

Setup a model of a **spiral galaxy** using the image above as a guide. The sand represents stars within the galaxy.

Explore It! #2

A spiral galaxy has a dense population of stars in the middle of it.

You will also notice that spiral galaxies have "arms" that stretch out from the middle of the galaxy.

Explore It! #3

Now locate our Sun. It is about 2/3 of the way out from the center, located on the edge of one of the arms.

Use the toothpick and label to mark it.

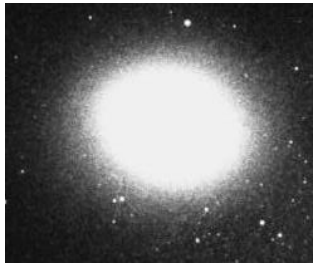
Explore It! #4

The planets in our solar system only surround that one tiny star.

The next closest star is 1000 times farther away from Earth than our Sun.

There are over 100,000,000,000 (billion) stars in our galaxy!

Explore It! #5



Setup a model of an **elliptical galaxy** using the image above as a guide. The sand represents stars within the galaxy.

Explore It! #6

An **elliptical galaxy** is football shaped and doesn't have 'arms' on it.

The stars in an **elliptical galaxy** are evenly spread out throughout the galaxy.

Explore It! #7

1. Setup a model of an **irregular galaxy** using the image above as a guide. The sand represents stars within the galaxy.

Explore It! #8

An **irregular galaxy** doesn't have a defined shape or pattern.

These galaxies are still forming or are the leftovers of two or more clashing galaxies.

Explore It!
#9

On your lab sheet list two characteristics of a **spiral galaxy.**

Explore It!
#10

On your lab sheet list two characteristics of an **elliptical galaxy.**

Explore It!
#11

On your lab sheet list two characteristics of an **irregular galaxy.**

Illustrate It! Station Directions

Each member of the group will draw a quick sketch on the lab sheet the shows they understand the concept that is being taught.

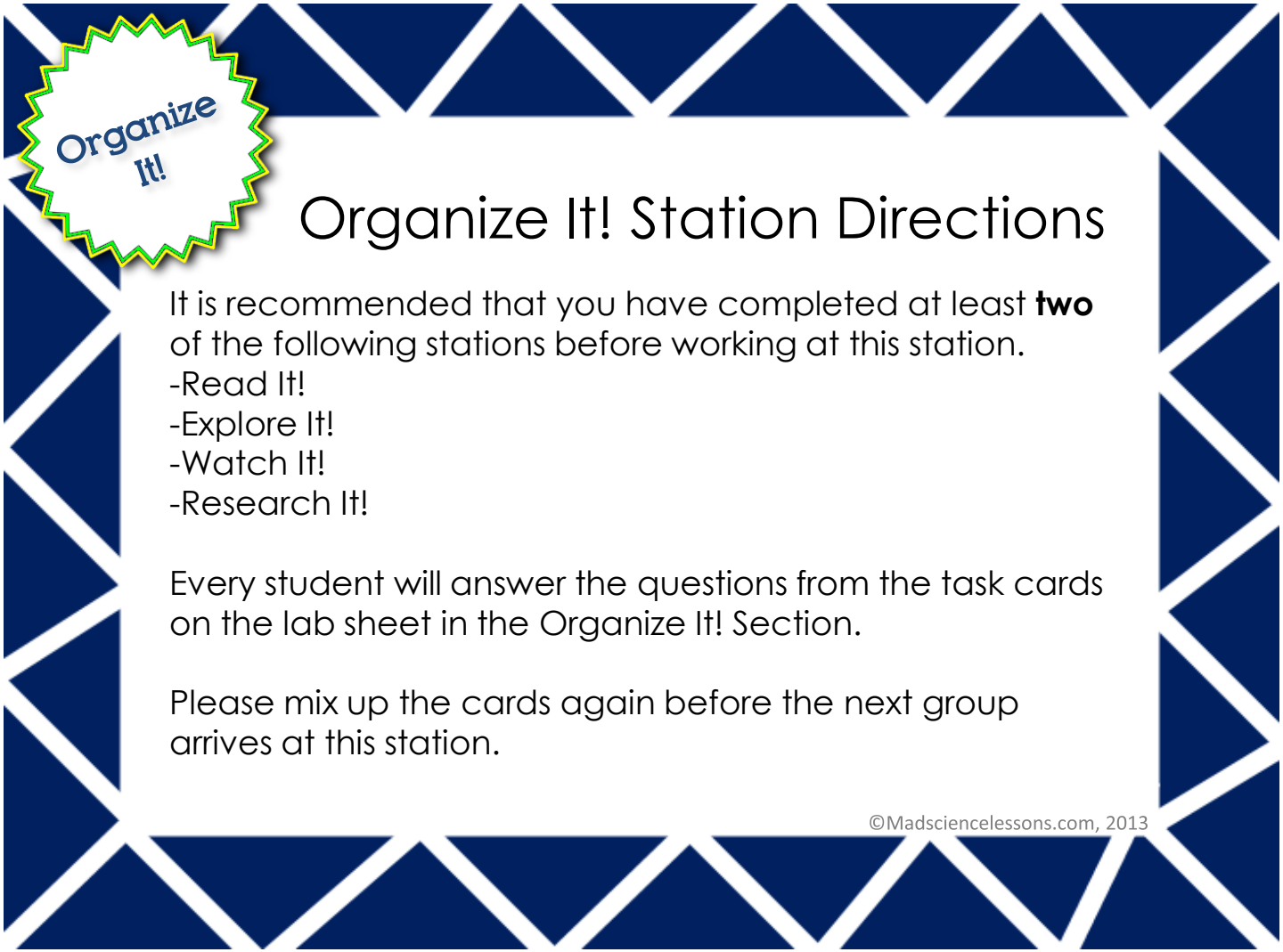
Use the map colors and markers that are provided.

The directions for the sketch are provided on the task card at the table.

Illustrate It! Station Directions

Draw a picture in the illustrate section of your lab sheet to show what a spiral, elliptical, and an irregular galaxy look like.

Be sure to label each of them.



Organize It! Station Directions

It is recommended that you have completed at least **two** of the following stations before working at this station.
-Read It!
-Explore It!
-Watch It!
-Research It!

Every student will answer the questions from the task cards on the lab sheet in the Organize It! Section.

Please mix up the cards again before the next group arrives at this station.

Organize It!
#1

Use the cards to organize the 3 types of galaxies and their characteristics.

Organize It!
#2

List the characteristics on your lab sheet

Spiral Galaxy

Irregular Galaxy

Elliptical Galaxy

Milky Way
The Sun is located in this galaxy
Dense cluster of stars in the center
“arms” coming out from the center of the galaxy
No consistent shape
No recognizable pattern
Football shaped
Stars are evenly spread out throughout the galaxy

Galaxies Name_____

Explore It!

Task Card #9:

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Task Card #10:

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Task Card #11:

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Write It!

Task Card #1:

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Task Card #2:

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Task Card #3:

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Galaxies Name_____

Illustrate It!

Assess It!

#1_____ #2_____
#3_____ #4_____

Read It!

#1_____ #2_____
#3_____ #4_____

Research It!

Task Card #2:

1.

2.

Task Card #3:

1.

Task Card #4:

1.

Organize It!

Spiral:

Irregular:

Elliptical:

Galaxies Name_____

Watch It!

Task Card #2:

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Task Card #3:

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Task Card #4:

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