8th grade U.S. History
Lesson Plans for March 30 - April 3

Monday, March 30
Complete pages 115-122 in Sirius book

Tuesday, March 31
Complete pages 123-134 in Sirius book
Chat with Ms. Gibson on Google Hangouts (or phone)

Wednesday, April 1
Complete pages 135-143

Thursday, April 2
Complete pages 144-150
Chat with Ms. Gibson on Google Hangouts (or phone)

Friday, April 3
Answer thinking questions 1-3 (via email or hangouts)
(if you don't have internet service, please turn this paper in with your other work)

1. How did the building of factories, railroads and telegraph lines change the way goods were marketed?
2. What were the positive and negative consequences of urbanization?
3. How did industrialization in the northern United States influence the practice of slavery and the plantation system across the southern United States?

Lesson Instructions for March 30 - April 3

Day 1: Percents of a number

IXL - J6

Day 2: Percents of a number

IXL - J7

Day 3: Percents of a number

IXL - J8

Day 4: Financial Literacy Vocabulary

Use the provided vocabulary and find everyday examples for each vocabulary word. Each word must have at least one example. You can choose to do pictures representing examples if you would rather.

Day 5: Finding and Comparing Interest

Go Math book, pages 445 and 446

If you need assistance, contact me via email using your school gmail and/or using google classroom (the same one we use for Escape Book). Videos over the weeks lessons will be posted. I will be staying logged into google classroom so I should be able to respond quickly. If possible include pictures of the work you have questions about. If you have not already signed up for the classroom, use the code **fbpjlwr** to sign in.

Respectfully

Mr. J. North

jnorth@rice-isd.org

Hey there! This week we will be moving into our new unit. This unit covers making connections across texts (paired selections). In your packet for this week, I have included a print-out version of the lesson, as well as a paired passage. My suggestion would be to complete them as follows:

Monday: Read the lesson and make any notes necessary.
Tuesday: Read the first passage of the paired selection and annotate the text.
Wednesday: Read the second passage of the paired selection and annotate the text.
Thursday: Reread/skim the passages. Complete the "Making Connections" graphic organizer using the information from both texts to complete.
Friday: Complete the Venn diagram for the texts. How were the texts different? What did they have in common?

Don't forget to read! Try your best to read 20 minutes each day - this builds comprehension (understanding), vocabulary (new words), and fluency (flow). If you are able, keep a journal and write in it daily (about what you read or just your thoughts about everything going on right now). Take care!

♡ Mrs. Flores

¡Hola! Esta semana nos mudaremos a nuestra nueva unidad. Esta unidad cubre hacer conexiones a través de textos (selecciones emparejadas). En su paquete para esta semana, he incluido una versión impresa de la lección, así como un pasaje emparejado. Mi sugerencia sería completarlos de la siguiente manera:

Lunes: lea la lección y tome las notas necesarias.
Martes: lea el primer pasaje de la selección emparejada y anote el texto.
Miércoles: lea el segundo pasaje de la selección emparejada y anote el texto.
Jueves: releer / leer los pasajes. Complete el organizador gráfico "Hacer conexiones" utilizando la información de ambos textos para completar.
Viernes: Completa el diagrama de Venn para los textos. ¿Cómo fueron diferentes los textos? ¿Qué tenían en común?

¡No te olvides de leer! Haga su mejor esfuerzo para leer 20 minutos cada día, esto construye comprensión (comprensión), vocabulario (palabras nuevas) y fluidez (flujo). Si puede, mantenga un diario y escríbalo diariamente (sobre lo que leyó o simplemente sus pensamientos sobre todo lo que está sucediendo en este momento). ¡Cuídate!

♡Mrs. Flores

Synthesize Ideas in Informational/Expository Text

Resource ID: **E8RdM3L3** Grade Range: **8**

SECTIONS

- Introduction
- Getting Ready to Read
- Checking for Understanding
- Writing a Response to a Question Using Textual Evidence
- Your Turn
- Resources

Introduction

Source: War-of-the-worlds-tripod, Henrique Alvim Correia, Wikimedia

On Halloween night in 1938, many residents of New Jersey thought the country was being invaded by Martians. Hysteria spread as many people huddled in cellars, crowded the roads, and went so far as to wrap their heads in wet towels to protect themselves from the poisonous gas of the Martians. They had mistaken a radio adaptation of the science fiction novel *War of the Worlds* by H.G. Wells as a real Martian invasion.

That night is a dramatic example of what happens when people are given misinformation (or in this case, noninformation) and believe that what they're seeing and hearing is real. Writing about the events of that evening, newspaper columnist Dorothy Thompson saw that the broadcast revealed the way dishonest leaders might misuse the power of mass communications to create illusions and manipulate the public.

All unwittingly, Mr. Orson Welles and the Mercury Theater of the Air have made one of the most fascinating and important demonstrations of all time. They have proved that a few effective voices, accompanied by sound effects, can convince masses of people of a totally unreasonable, completely fantastic proposition as to create a nation-wide panic.

Most of us probably roll our eyes when we read about this story and think about how much more sophisticated we are in today's world. We think we would know better than those poor people in New Jersey almost 80 years ago because we have more resources at our fingertips: TVs, computers, social media, 24-hour cable networks, etc. However, are we better off and more savvy, or do we have a different kind of problem in our world?

Source: #IndySMB, joeshoe, Flickr

People in the 1930s had limited resources when it came to finding out whether they were actually being invaded by Martians. Today, however, we have the opposite problem: too many resources. Special skill is needed to read all the resources about a given topic, synthesize that information, and finally, make an informed decision. While you probably won't have to decide whether the earth is being invaded by Martians, you will need to read, synthesize, and make logical connections and decisions about what you read and hear. You will need to use these skills for many kinds of issues and topics. In our busy world, you need to be able to sift through mountains of information to decide what is accurate and what is not.

You do this every day when you read the newspaper, watch television, or use social media. You have to make comparisons and choices about what you read and hear, holding on to some information and discarding other bits. You learn early (often in the cereal aisle of the grocery store) how to figure out which advertisements are worthy of your money and which are propaganda and not worth your money.

Source: Reading a book in the sunshine, and pretending that I don't even care if anyone is watching me ..., Ed Yourdon, Flickr

The decision-making skills you employed as a child while shopping for Cheerios or Fruit Loops helped you practice sorting through information, dissecting it, and making decisions and choices about it. That was just the beginning, yet it shows how important learning to read accurately and synthesize information is in today's world.

In this lesson, you will expand on your ability to read texts, synthesize them, and make choices based on the information you read. Finally, you will learn how to use textual evidence to support your decisions and opinions about your reading.

Getting Ready to Read

Source: 593484main pia14839 full Curiosity's Sky Crane Maneuver, Artist's Concept, NASA/JPL-Caltech, Wikimedia

In this section, you are going to read about people who are writing and talking about Mars in a way that's somewhat opposite of *War of the Worlds*. The two informational articles you will read specifically talk about Earthlings going to Mars to live. One article is from the *New York Times*, and the other article (an excerpt) is from the space.com website.

How do you keep two texts in your head at one time, though, and remember their similarities and differences? When you read a text and think about texts you've read before, you are reading intertextually. Connecting your reading to prior texts adds value because you're connecting what you're reading to prior knowledge. How do you do this as you're reading? You start with having a conversation with yourself about other texts you have read that connect to the text you're reading.

Here's some help to get you started. The first thing to do is read and annotate. This way, when you go back to the texts a second or third time, you can read the articles faster because you will have made notes on the texts and in the margins. Let's talk about how to annotate. You may already know how to annotate as you read, but if you don't, you may want to review the English I resource *Annotating for Meaning* in the Related Resources. To annotate the two articles you are about to read, follow these simple directions:

1. Read the shorter or the easier article first without annotating.
2. Read the longer or more difficult text next, annotating the second article with the first one in mind.
3. Finally, return to the first article and annotate it thoroughly.

The chart below will help you as you continue to improve your annotation skills.

Tools	Techniques	Information to mark
• Highlighters in a variety of colors • Colored pencils • Pens in a variety of colors • Sticky notes • Photocopies of pages from textbooks, library books, and books you have borrowed from others (in other words, books you can't mark)	• Highlighting • Underlining (straight and squiggly lines) • Boxing and circling • Enclosing information in [brackets] and (parentheses) • Numbering (1, 2, 3) and/or lettering (a, b, c) important points • Drawing arrows to connect related ideas → • Using icons (e.g., smiley faces) to express your	• Title, subtitle, headings, author's name, information about the author, captions that explain images • Unfamiliar words • Main ideas • Important details • Steps in a process • Examples of literary devices or rhetorical devices • The "5 Ws": *who*, *what*, *where*, *when*, and *why* • Repetitions

Instructions: Read and annotate the two articles that follow. You can annotate them electronically using your computer's software, or you can download and print this PDF to annotate the articles by hand. When you're finished, return to the lesson.

The Call of Mars

by

Buzz Aldrin

Source: Aldrin Apollo 11 cropped, NASA, Wikimedia

When I view the Moon, there are times when I feel like I'm on a time machine. I am back to a cherished point in the past — now nearly 45 years ago — when Neil Armstrong and I stood on that bleak, but magnificent lunar landscape called the Sea of Tranquility.

While we were farther away from Earth than humans had ever been, the fact is that we weren't alone. An estimated 600 million people back on Earth, at that time the largest television audience in history, watched us plant our footprints on the Moon.

Fast forward to today. Now I see the Moon in a far different light — not as a destination but more a point of departure, one that places humankind on a trajectory to homestead Mars and become a two-planet species.

It is time to lay the groundwork for effective global human exploration of space.

NASA's Apollo program adopted a get-there-in-a-hurry, straightforward space race strategy that left the former Soviet Union in the lunar dust. Doing so meant don't waste time developing reusability. Let's close that chapter in the space exploration history books.

I am calling for a unified international effort to explore and utilize the Moon, a partnership that involves commercial enterprise and other nations building upon Apollo. Let me emphasize: A second "race to the Moon" is a dead end. America should chart a course of being the leader of this international activity to develop the Moon. The United States can help other nations do things that they want to do, a fruitful avenue for U.S. foreign policy and diplomacy.

A step in the right direction is creating an International Lunar Development Corporation, customized to draw upon the legacy of lessons learned from such endeavors as the International Geophysical Year (whose purpose was to get scientists all over the world to focus on the physics and atmosphere of the Earth), the International Space Station program, as well as model organizations such as Intelsat and the European Space Agency. Space collaboration should be the new norm, including the tapping of talented Chinese, Indian and other space experts from around the globe.

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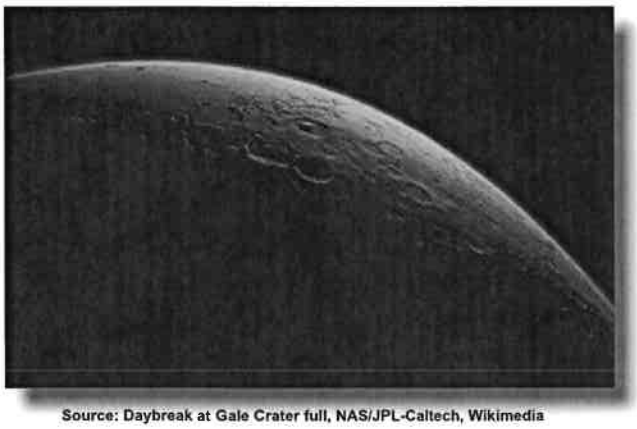
In my view, U.S. resources are better spent on moving toward establishing a human presence on Mars. I envision a comprehensive plan that would lead to permanent human settlement on Mars in the next 25 years. To get under way, the International Space Station can serve as a test bed for long-duration life support and for technologies that can safely, reliably and routinely transport crews to the distant shores of Mars. I've championed the creation of spacecraft to be placed on continuous loops between Mars and Earth, thereby putting in place a pathway to sustainability that forever links the two planets.

Going to Mars means staying on Mars — a mission by which we are building up a confidence level to become a two-planet species. At Mars, we've been given a wonderful set of moons — one of which, perhaps Phobos, can act as an offshore world from which crews can robotically preposition hardware and establish radiation shielding on the Martian surface to begin sustaining increasing numbers of people. To succeed at Mars, you cannot stop with a one-shot foray to the surface.



Source: Daybreak at Gale Crater full, NAS/JPL-Caltech, Wikimedia

My passion for space exploration is guided by two principles: a continuously expanding human presence in space, and retention of U.S. leadership in space. To move forward, what's required is what I term as a Unified Space Vision for America that is predicated on exploration, science, development, commerce and security. To reach beyond low Earth orbit requires a suite of missions that are the foundation for such a Unified Space Vision. Putting in place and staying on track with this unified approach must begin now.

I call for an international effort to further explore and utilize the Moon. It would be a partnership that involves commercial enterprise and other nations building upon the Apollo legacy. But the real calling is Mars.

By implementing a step-by-step vision — just as the United States did with the single-seat Mercury capsule, followed by the two-person Gemini spacecraft that made Apollo possible — humankind can push outward to the distant dunes of Mars.

Our Earth isn't the only world for us anymore. It's time to seek out new frontiers.

Buzz Aldrin, the second man to walk on the Moon, is the author, most recently, of "Mission to Mars: My Vision for Space Exploration," written with Leonard David.

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The Homestead Project: Making a Mars Settlement a Reality

by
Ker Than

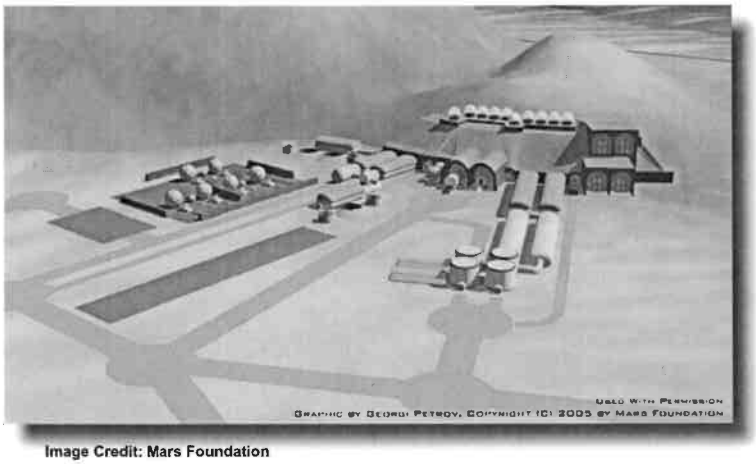

Image Credit: Mars Foundation

The Mars Foundation's hope for humanity's future on Mars is neatly summed up by their slogan: "To arrive, survive and thrive!". . .

At the International Conference on Environmental Systems (SAE-ICES) in Rome, the group presented plans for a permanent settlement they believe can be built using near-term technologies and resources already available on Mars.

The Mars Foundation is a non-profit organization made up of approximately 30 volunteer members, many of them scientists and engineers, and their effort is called the "Homestead Project."

According to the plans, the settlement will rely on a curious blend of old and new technology: it will be built with the aid of robots and run on nuclear energy, but will utilize materials and building techniques reminiscent of earlier centuries on earth.

One possible scenario, the group proposes is to send small gas tanks ahead that store methane and oxygen extracted from the atmosphere. When the settlers arrive, they can then use that equipment and stored gas to build things like steel production plants.

Finally, Mars will be an integral part of an inter-solar system economy that the group believes will develop within the next century, one based on the convergence of four frontiers: Earth, the Moon, asteroids, and Mars — including its own rocky satellites, Phobos and Deimos.

Many of the technologies developed for use on Mars will also have applications for the other frontiers . . . . Life support systems and mining equipment developed for use on Mars could also be used on the moon.

The group said . . . they are not trying to compete with NASA or any other space organization.

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"We kind of look at NASA and the European Space Agency as analogous to Lewis and Clark in the old west," Homnick said. "They blaze the trail, go out to explore and do the science. Well, we are analogous to the pioneers — we follow the trail that they blazed, and we make the new frontier home and we add value."

Source: Terraforming of Mars, D Mirtiy, Wikimedia

"We hope they succeed because they'll help us succeed," said Palaia.

The settlement will be an oasis built for posterity, one the group believes future generations will come to regard as "a place of veneration and pilgrimage."

With this in mind, the group's settlement designs call for the planting of a First Tree. . . .

"That was very important to us," said Palaia. "We wanted to have this in there as a symbol of bringing life to [Mars]."

Mackenzie and Homnick are both middle-aged and doubt they'll be able to go to Mars themselves. But Palaila, 25, thinks he may have a chance.

Whether he'll be able to remain on Mars permanently, however, is another matter.

"It's a point of contention with my wife," he said.

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Making Connections

readwritethink
International Reading Association NCTE

- **Text-to-Self** connections:
  - o What does this text remind you of?
  - o Can you relate to the characters in the text?
  - o Does anything in this text remind you of anything in your own life?
- **Text-to-Text** connections:
  - o What does this remind you of in another text you have read?
  - o How is this text similar to other things you have read?
  - o How is this text different from other things you have read?
- **Text-to-World** connections:
  - o What does this remind you of in the real world?
  - o How are events in this text similar to things that happen in the real world?
  - o How are events in this text different from things that happen in the real world?

Passage or Quote from Text	Explain the connection you made to yourself, another text, or the real world.	What kind of connection did you make?
		❑ Text-to-Self ❑ Text-to-Text ❑ Text-to-World
		❑ Text-to-Self ❑ Text-to-Text ❑ Text-to-World
		❑ Text-to-Self ❑ Text-to-Text ❑ Text-to-World
		❑ Text-to-Self ❑ Text-to-Text ❑ Text-to-World
		❑ Text-to-Self ❑ Text-to-Text ❑ Text-to-World
		❑ Text-to-Self ❑ Text-to-Text ❑ Text-to-World
		❑ Text-to-Self ❑ Text-to-Text ❑ Text-to-World

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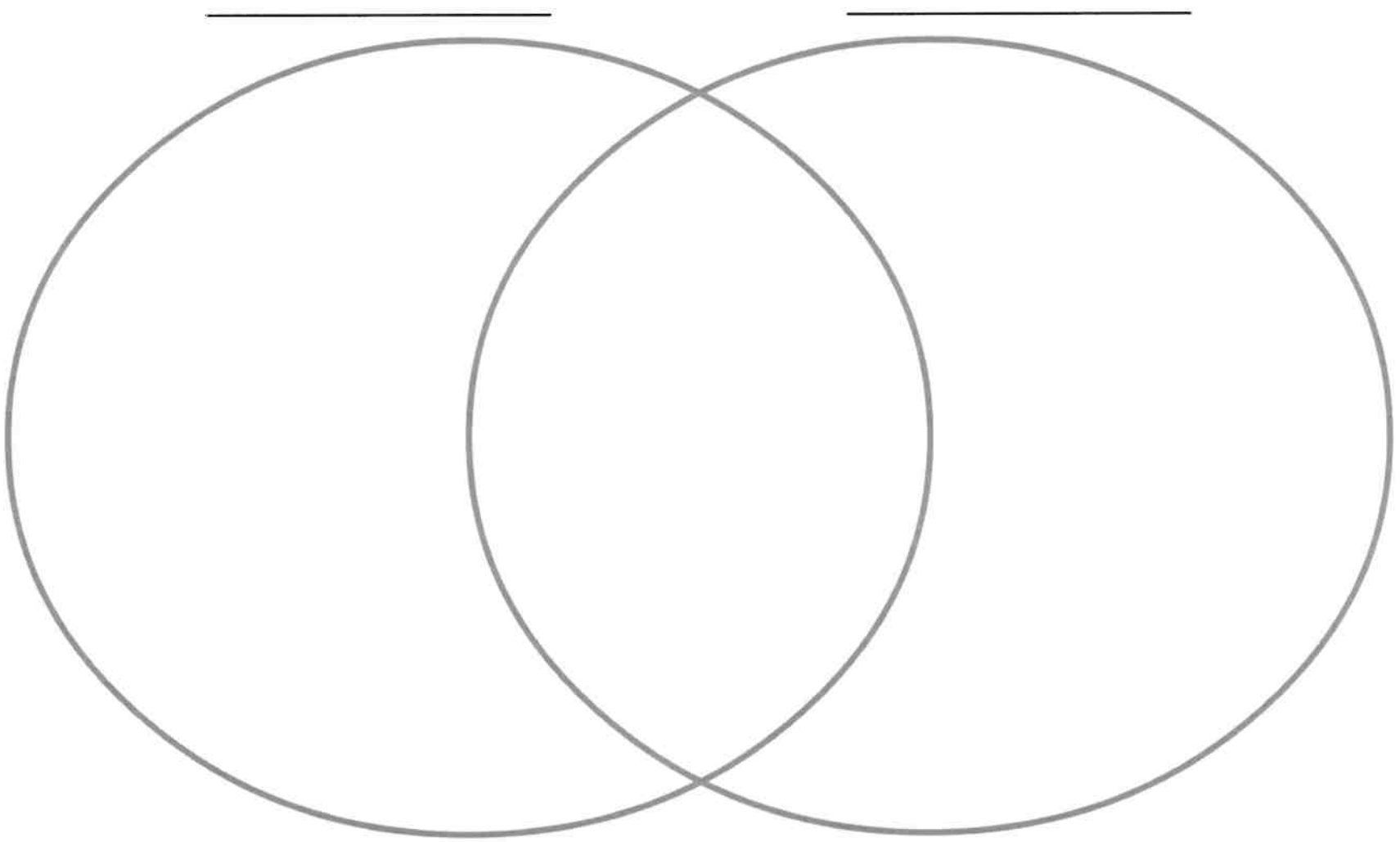
Venn Diagram



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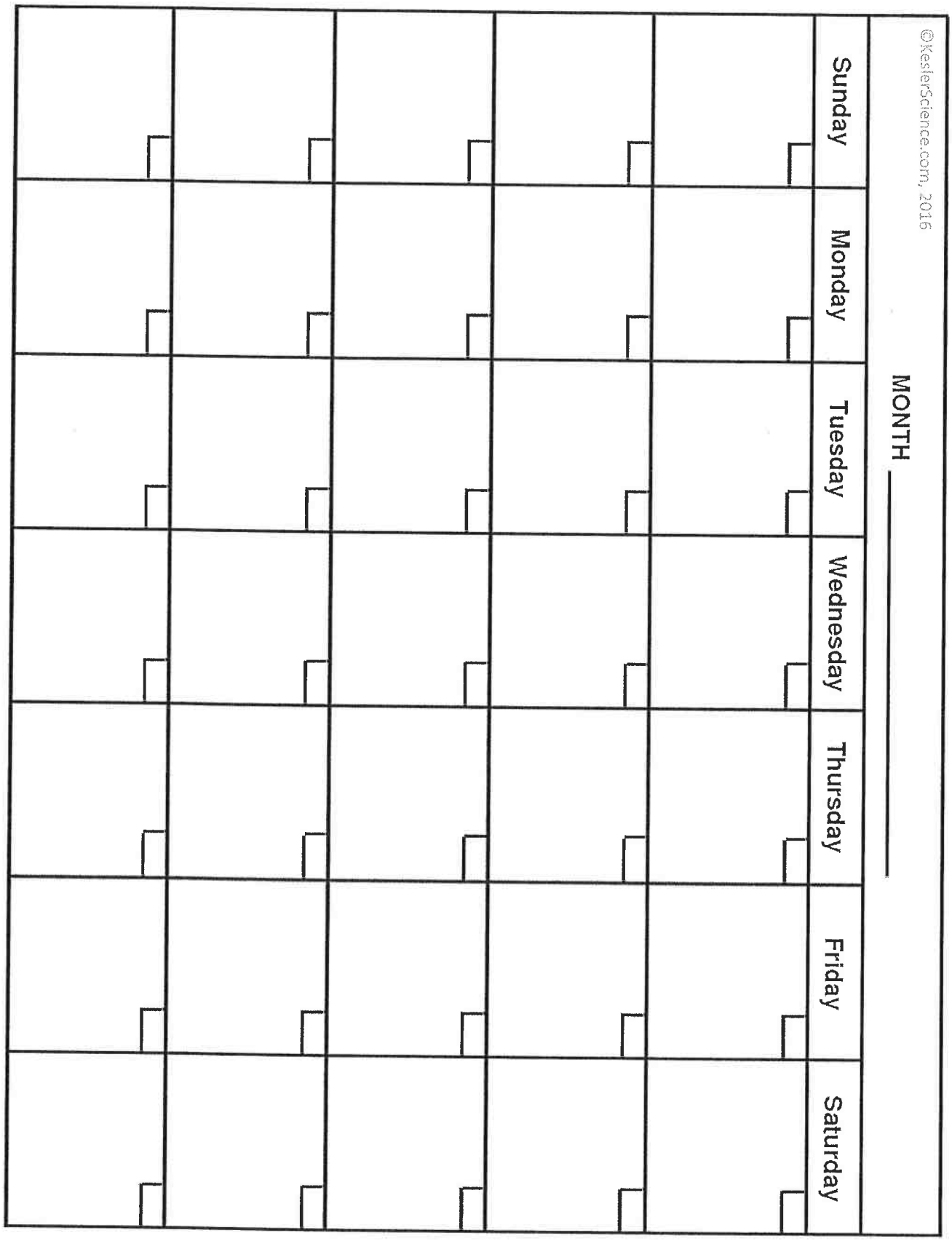
Science
Week of 3/30-4/3

The work for this week should be completed in the following order:

1. Track the lunar cycle- This needs to be done every night. Do not lose this paper, you will need it for the entire month.
2. Galaxies and Light Years Stations- If you can not watch the video or go to the research website then just skip that part.
    a. I advise completing the stations in the following order:
        i. Watch It
        ii. Research It
        iii. Read It
        iv. Explore It
        v. Illustrate It
        vi. Write It
        vii. Organize It
        viii. Assess It
3. Galaxies and Light Years Powerpoint- Read through and make notes as you read. Complete all slides.
4. STEMscopes Reading Science- Read through the passage and answer all questions.
5. STEMscopes Read It!- Read through the passage and answer all questions.

If you need any help, you can email me. My email address is jwatson@rice-isd.org.

Moon Phases Calendar



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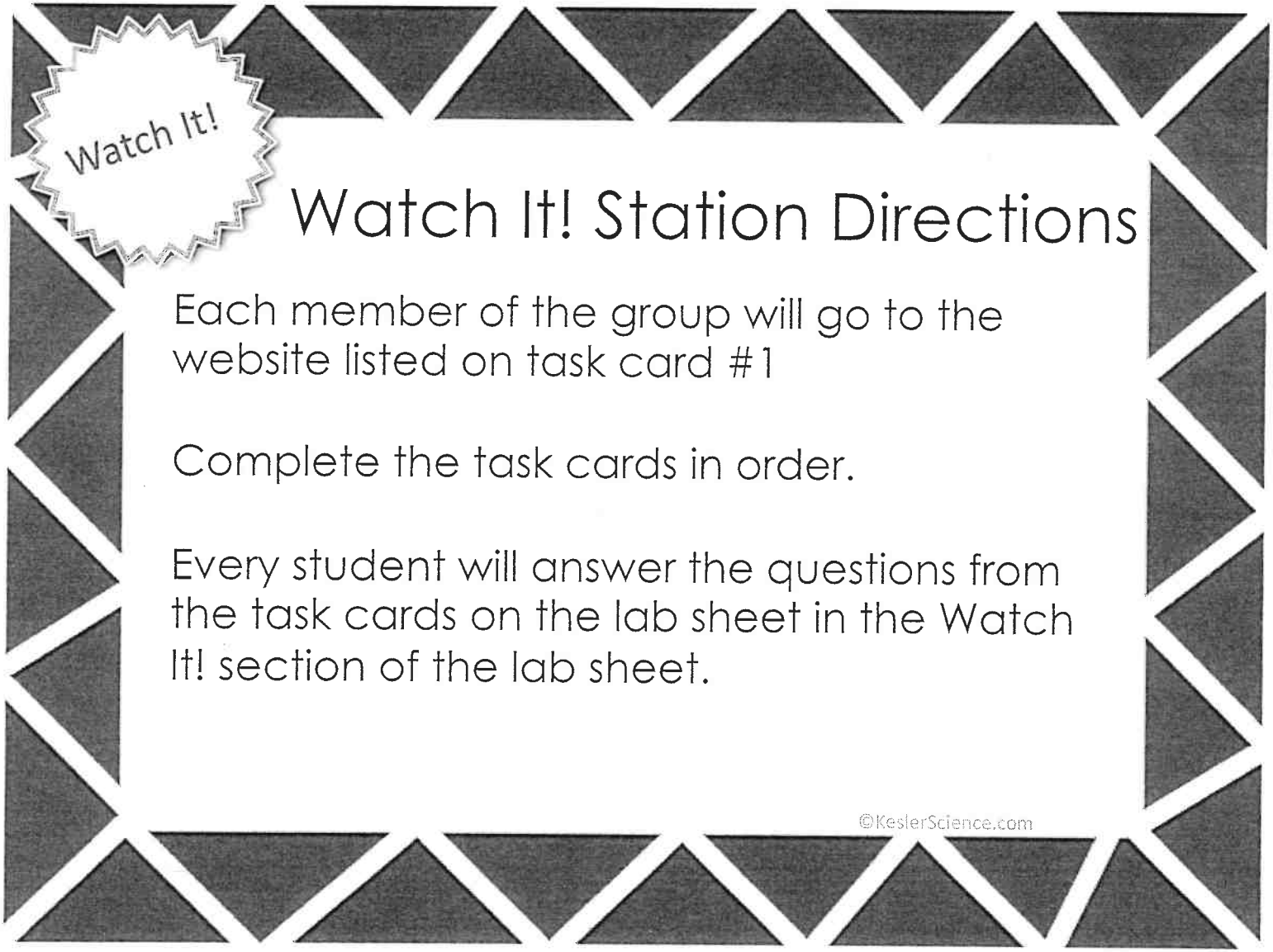

Watch It! Station Directions

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. YouTube: https://goo.gl/GbSb8v
   Cloud: https://goo.gl/tuQmk3
2. Press PLAY
3. Answer questions on cards #2 through #4

Watch It! #2

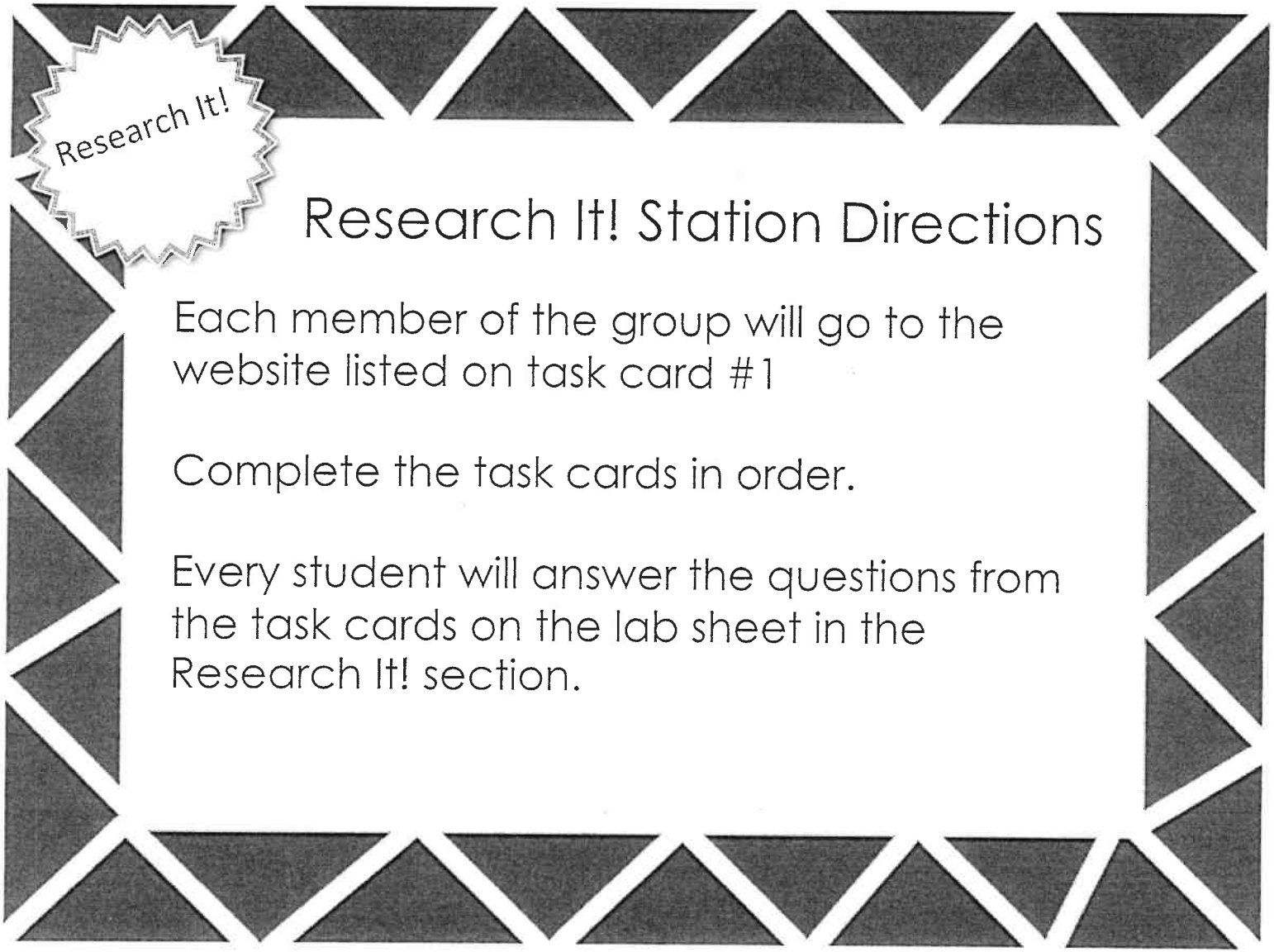
Briefly describe the process of nuclear fusion.

Watch It! #3

How does mass play a role in the life cycle of a star?

Watch It! #4

What is a white dwarf?



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 https://starinabox.lco.global/
2. Click the slider to "Normal" and then open the box

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Research It!
#2

1. Click on the temperature icon and play the simulation
2. Write down what you notice about the temperature of the star throughout its cycle.

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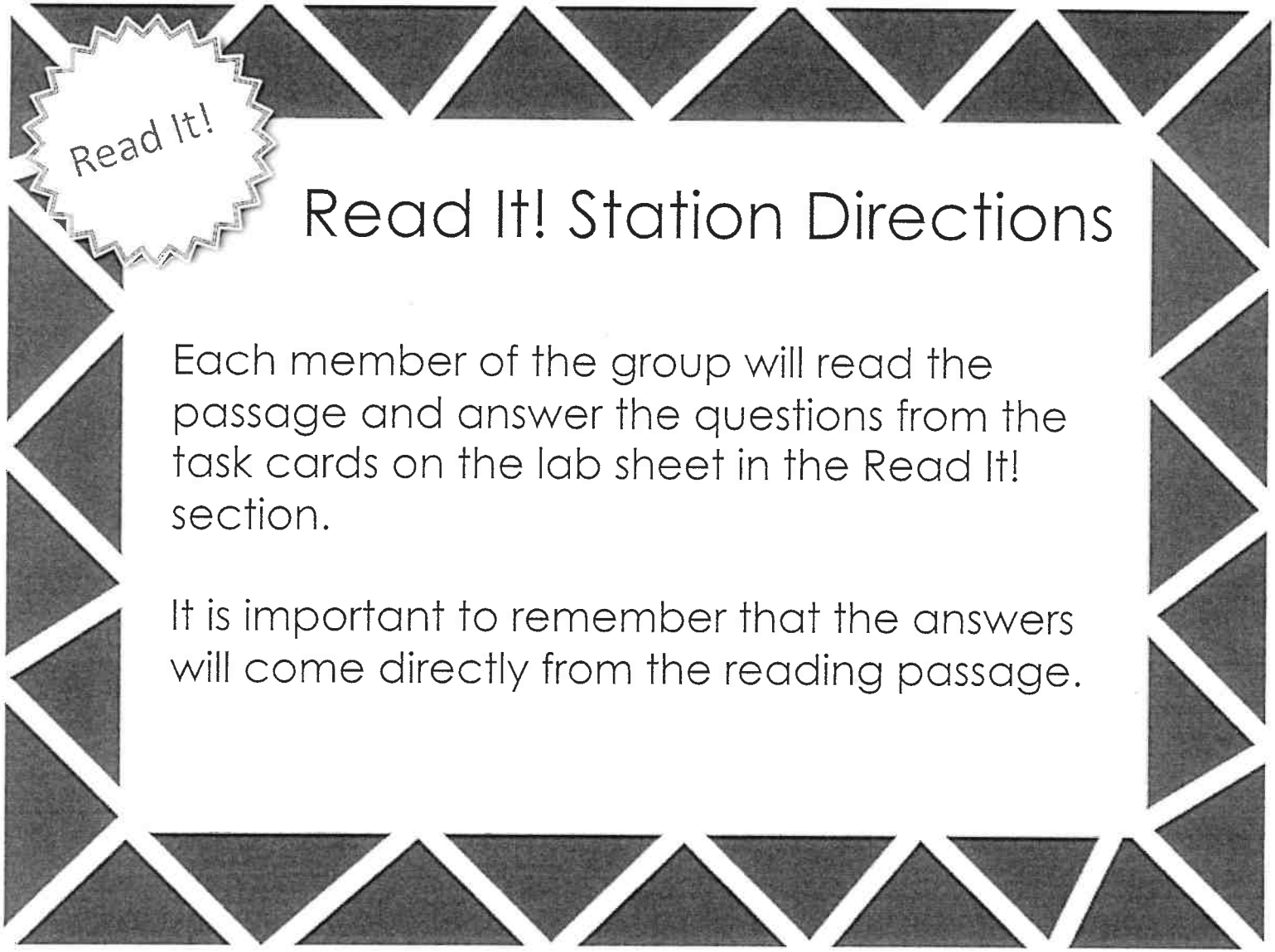
Research It!
#3

1. Click on the mass icon and play the simulation again.
2. Write down what you notice about the mass of the star throughout its cycle.

Research It!
#4

1. Click on "information" at the top of box
2. Read the information and explain why the star swells up as it goes through the life cycle.



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!

What is a Supernova?

A supernova is the explosion of a star. It is the largest explosion that takes place in space.

Where Do Supernovas Take Place?

Supernovas are often observed in other galaxies, but not many are seen in the Milky Way. The dust in our galaxy blocks our view. In 1604, Johannes Kepler discovered the last detected supernova in the Milky Way. NASA's Chandra telescope discovered the remains of a more recent supernova. It exploded in the Milky Way more than a hundred years ago.

What Causes a Supernova?

A supernova happens where there is a change in the core, or center, of a star. A change can occur in two different ways, with both resulting in a supernova.

The first type of supernova happens in binary star systems. Binary stars are two stars that orbit the same point. One of the stars, a carbon-oxygen **white dwarf**, steals matter from its companion star. Eventually, the white dwarf accumulates too much matter. Having too much matter causes the star to explode, resulting in a supernova.

The second type of supernova occurs at the end of a single star's lifetime. As the star runs out of nuclear fuel, some of its mass flows into its core. Eventually, the core is so heavy that it cannot withstand its own gravitational force. The core collapses, which results in the giant explosion of a supernova. The sun is a single star, but it does not have enough mass to become a supernova.

Why Do Scientists Study Supernovas?

A supernova burns for only a brief period, but it can tell scientists a lot about the universe. One kind of supernova has shown scientists that we live in an expanding universe, one that is growing at an ever-increasing rate.

Scientists also have determined that supernovas play a key role in distributes elements throughout the universe. When the star explodes, it shoots elements and debris into space. Many of the elements we find here on Earth are made in the core of stars. Some elements travel on to form new stars, planets, and everything else in the universe.

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Read It! #1

How can supernovas form?

A. When a white dwarf accumulates too much matter from another star
B. At the end of a star's life cycle when the fuel has run out and it explodes
C. In a nebula due to the force of gravity
D. Both A & B

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Read It! #2

Where do supernovas take place?

A. Between galaxies
B. In galaxies throughout the universe
C. In the center of the universe
D. Along the edge of the universe

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Read It! #3

What role do supernovas play in the universe?

A. They create all the sound we hear on Earth
B. The provide water to planets
C. They clean up the remains of stars
D. They help to spread matter and elements throughout the universe

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Read It! #4

Why are supernovas hard to spot in our own galaxy?

A. They are too far away
B. They are hidden behind the Sun
C. They are blocked by gas and dust
D. We can't see anything in our own galaxy

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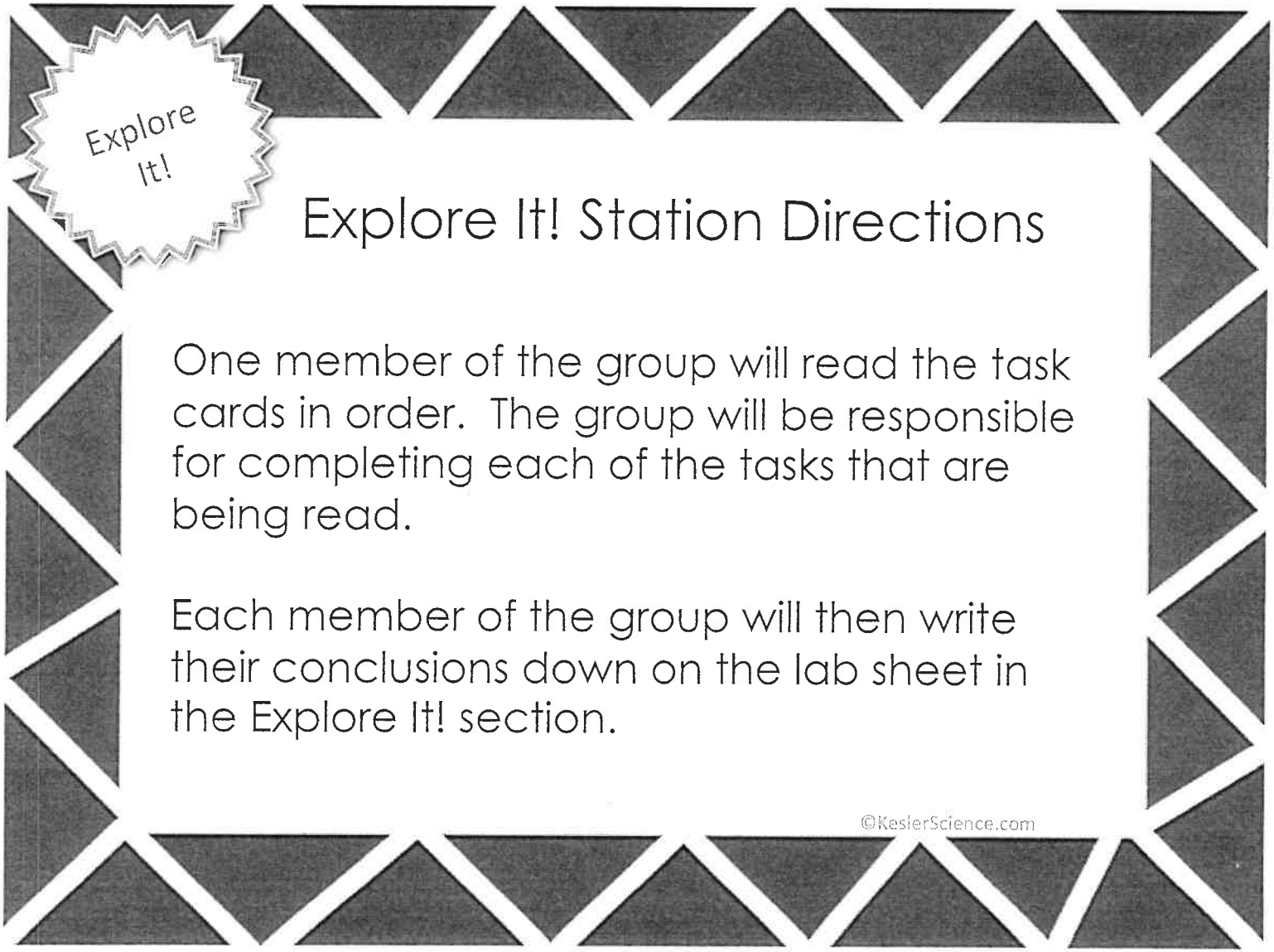

Explore It! Station Directions

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

1. Use the life cycle diagram to answer the questions.
2. Study the diagram for two minutes and write down some general observations on your lab sheet.

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Explore It! #2

The diagram shows the life cycle of a star. Stars have life cycles but they aren't really alive.

1. Where are stars born?
2. What determines which life cycle path a star takes?

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Explore It! #3

1. What are some differences between low-mass and high-mass star life cycles?
2. When are black holes formed?

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Explore It! #4

1. What part of the life cycle is our Sun in?
2. What do you think are some differences between a Red Giant and a Red Supergiant?
3. What appears to be happening during a Supernova event?

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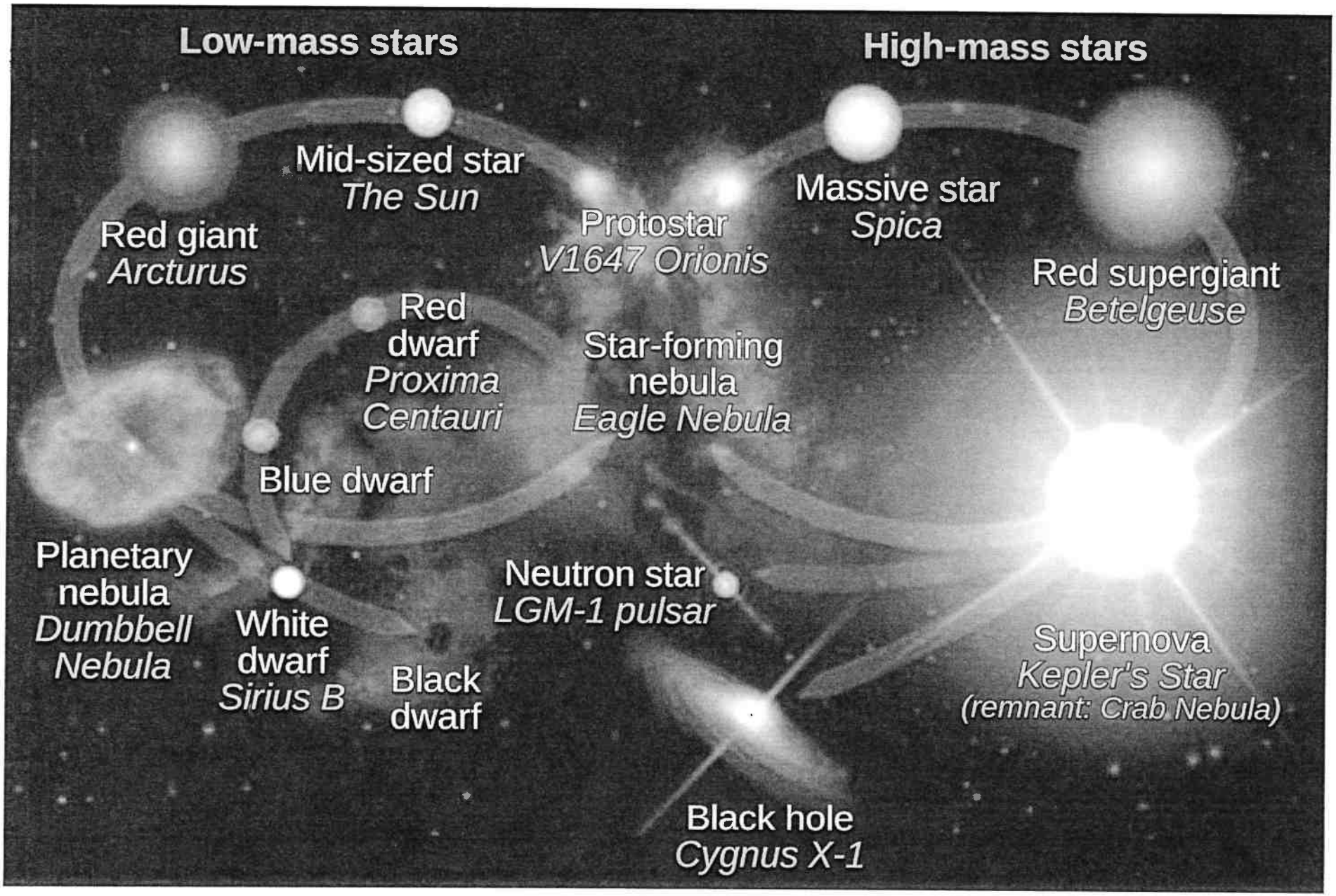
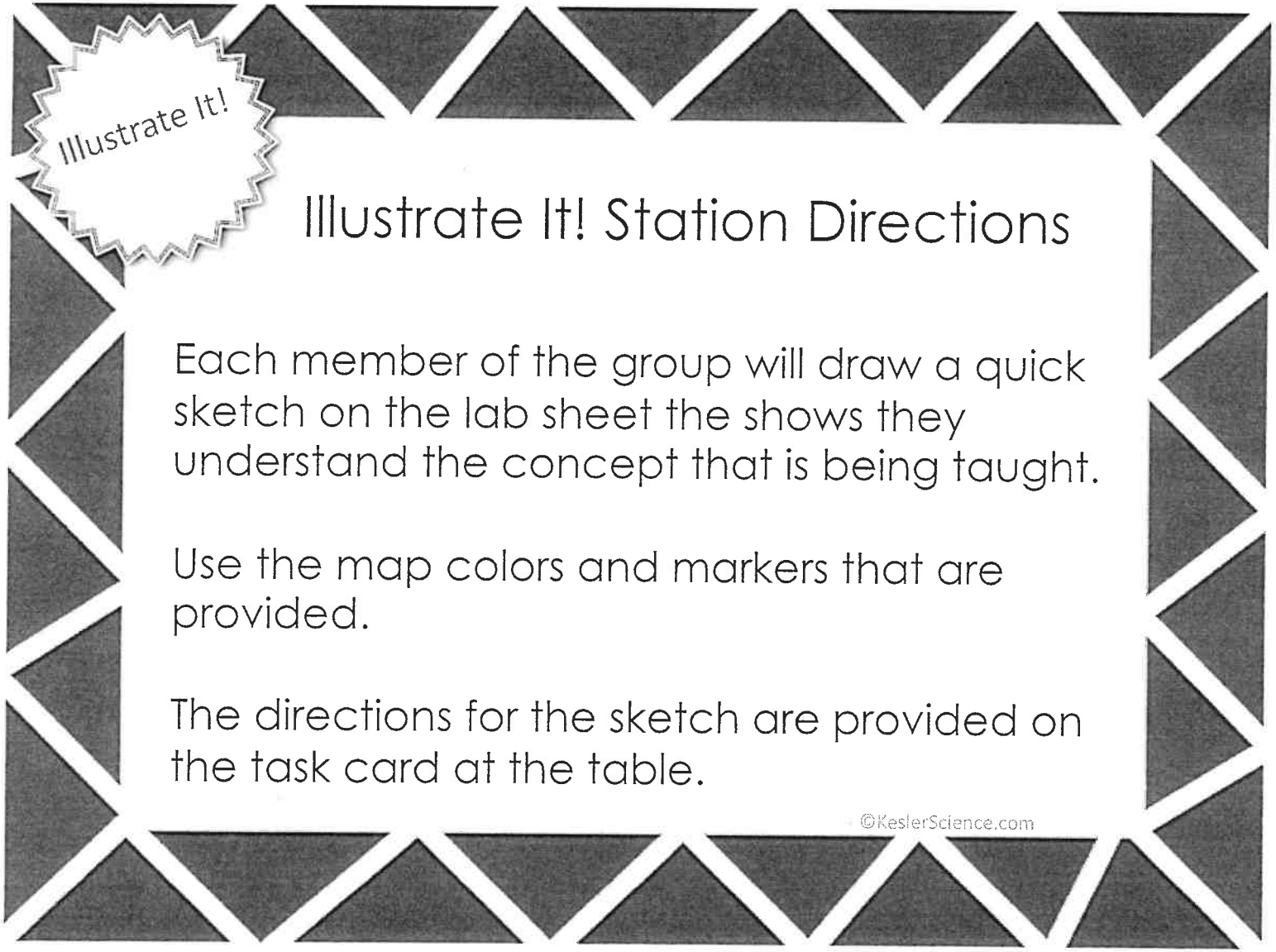

Low-mass stars
High-mass stars
Mid-sized star
The Sun
Red giant
Arcturus
Protostar
V1647 Orionis
Massive star
Spica
Red supergiant
Betelgeuse
Red
dwarf
Proxima
Centauri
Star-forming
nebula
Eagle Nebula
Blue dwarf
Planetary
nebula
Dumbbell
Nebula
White
dwarf
Sirius B
Neutron star
LGM-1 pulsar
Black
dwarf
Supernova
Kepler's Star
(remnant: Crab Nebula)
Black hole
Cygnus X-1



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.

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Illustrate It!

Illustrate It! Station Directions

Draw a life cycle diagram of low-mass and high-mass stars using a nebula as a starting point

Nebula

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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**.

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Write It!
#1

Explain how mass impacts the life cycle of a star.

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Write It!
#2

Describe the typical cycle of a low mass star.

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Write It!
#3

Describe the role of a nebula in the life cycle of a star.

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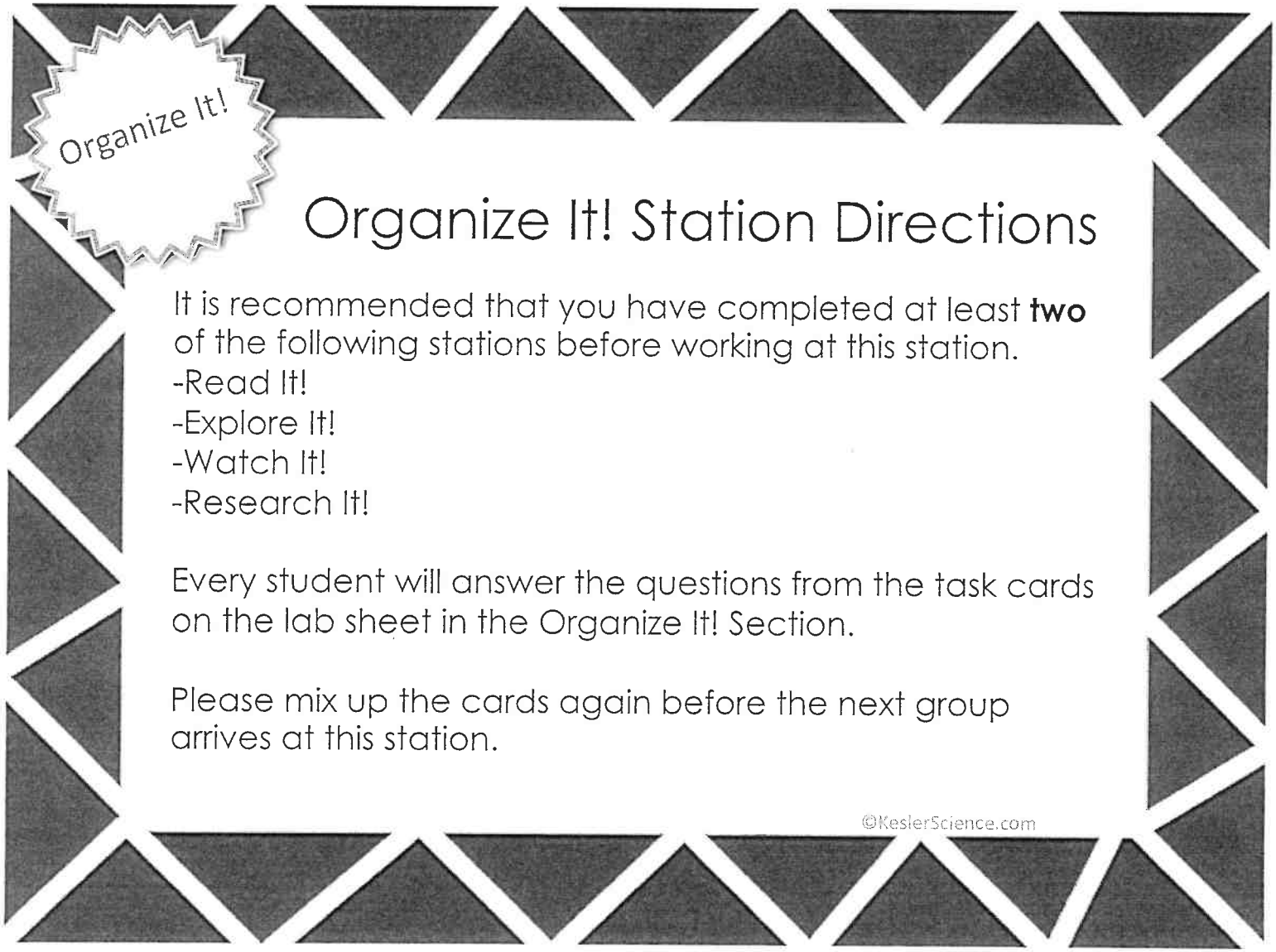

Organize It! Station Directions

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.

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Organize It!
#1

1. Use the pieces to build a star life cycle model.

2. Have your teacher sign your lab sheet when complete.

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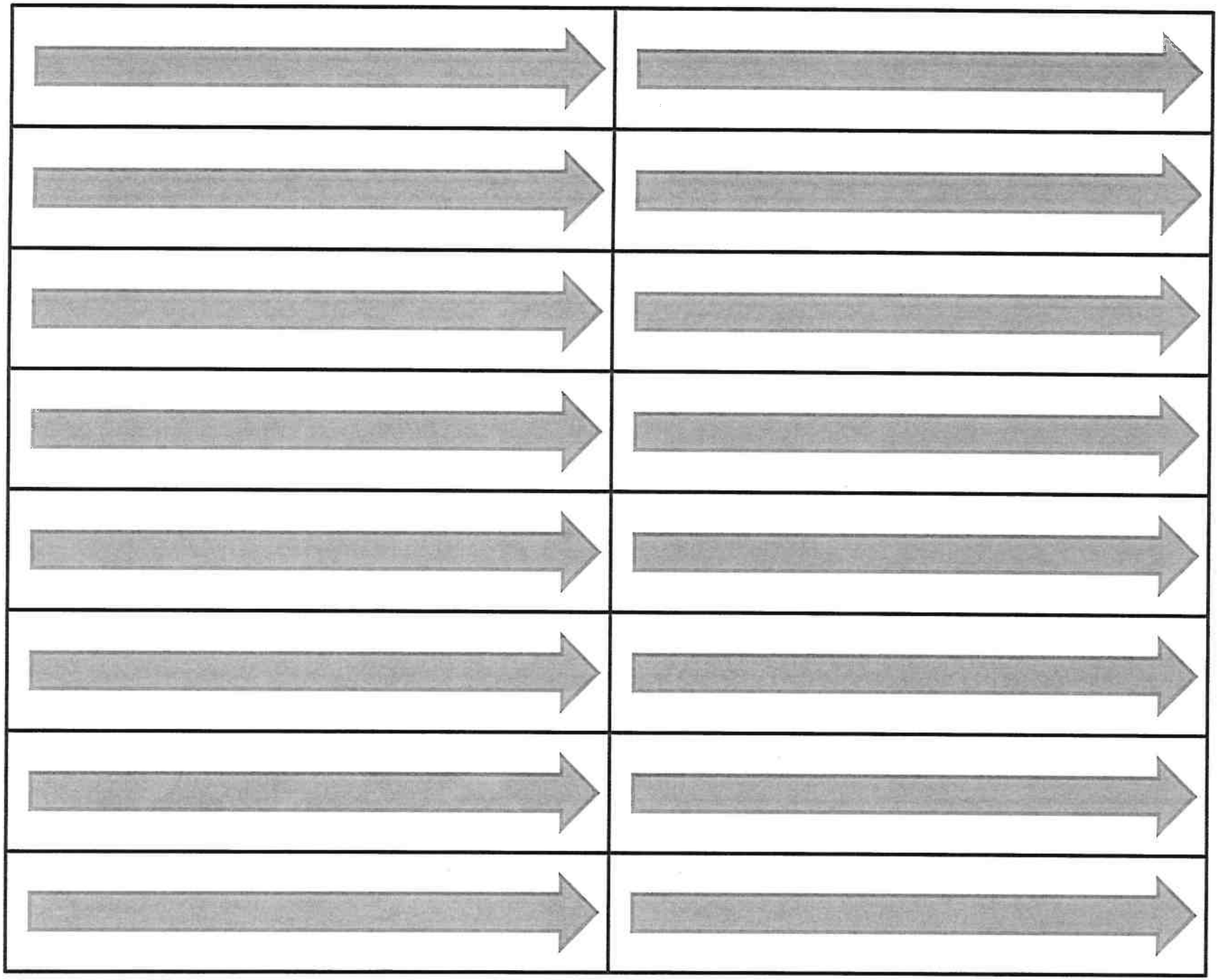

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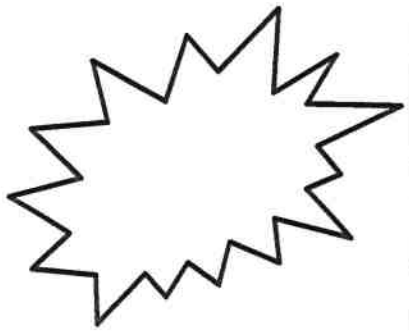
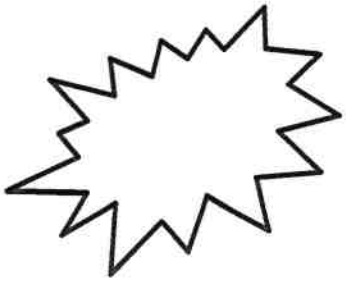


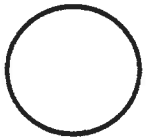
Nebula

Main Sequence

Red Giant



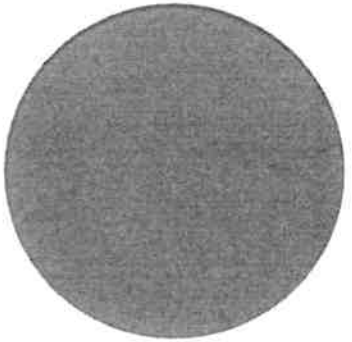
Planetary Nebula



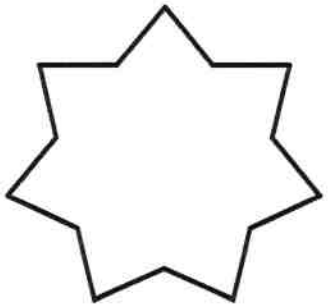
White Dwarf

Black Dwarf

Massive Star

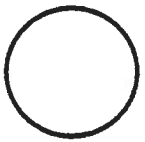


Red Supergiant



Supernova

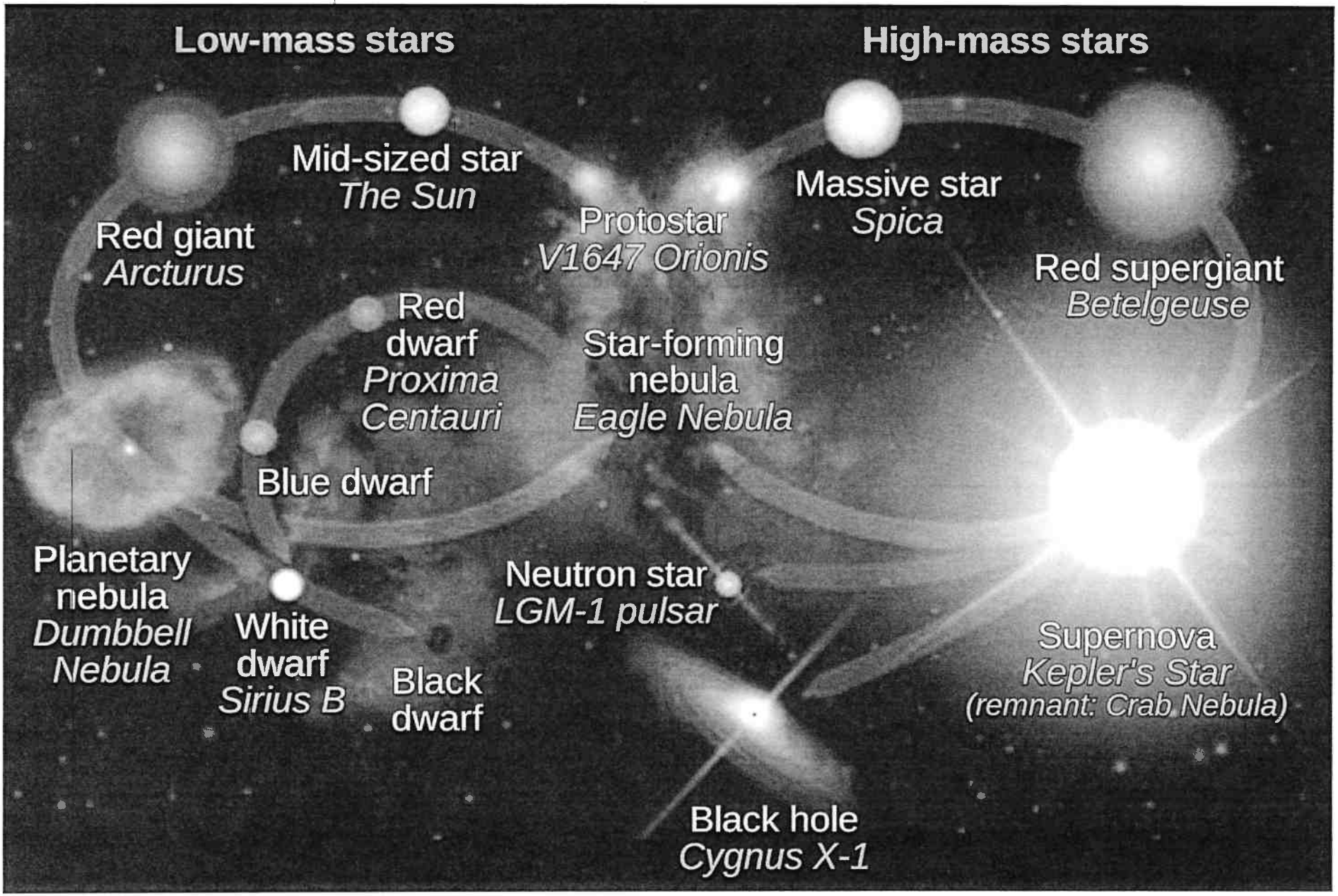
Black Hole

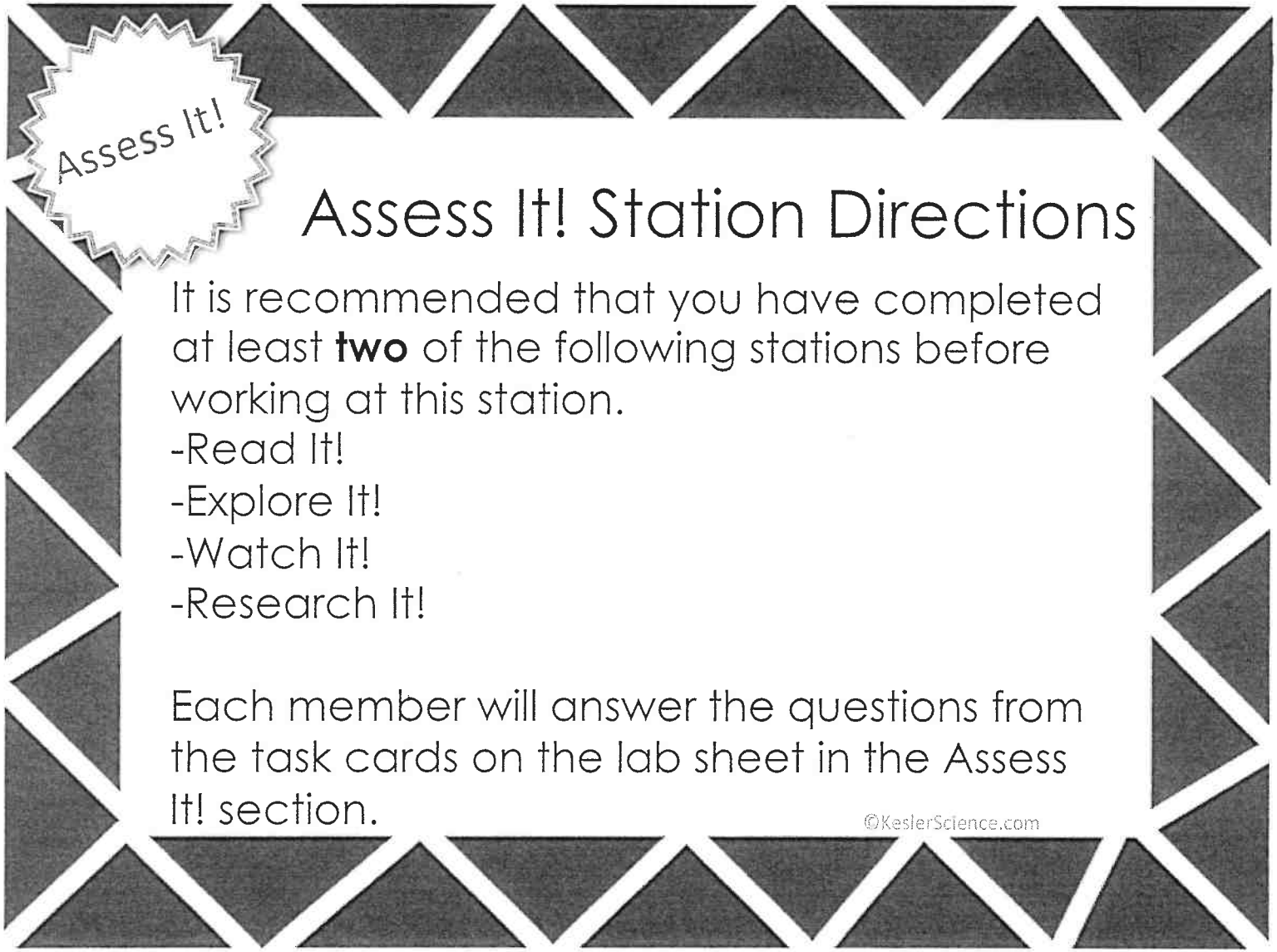


Neutron Star

Red Dwarf

Blue Dwarf


Low-mass stars
High-mass stars
Mid-sized star
The Sun
Red giant
Arcturus
Protostar
V1647 Orionis
Massive star
Spica
Red supergiant
Betelgeuse
Red
dwarf
Proxima
Centauri
Star-forming
nebula
Eagle Nebula
Blue dwarf
Planetary
nebula
Dumbbell
Nebula
White
dwarf
Sirius B
Neutron star
LGM-1 pulsar
Black
dwarf
Supernova
Kepler's Star
(remnant: Crab Nebula)
Black hole
Cygnus X-1



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.

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Assess It! #1

Where are stars formed?

A. A planetary nebula
B. Near the center of the universe
C. A nebula
D. A dying planet

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Assess It! #2

What is a black hole?

A. A collapsed star with gravity so dense nothing can escape from it
B. A cool spot on the surface of a star
C. A cool spot on the surface of a planet
D. An area in space where stars are created

Assess It! #3

What factor(s) impacts the life cycle of a star?

A. Energy
B. Mass
C. Size
D. All of the above

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Assess It! #4

A low mass star becomes a _____ after the main sequence phase?

A. white dwarf
B. black hole
C. red giant
D. red supergiant

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Galaxies Name_____

Explore It!

Task Card #9:

Task Card #10:

Task Card #11:

Write It!

Task Card #1:

Task Card #2:

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:

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Galaxies Name_____

Watch It!

Task Card #2:

Task Card #3:

Task Card #4:

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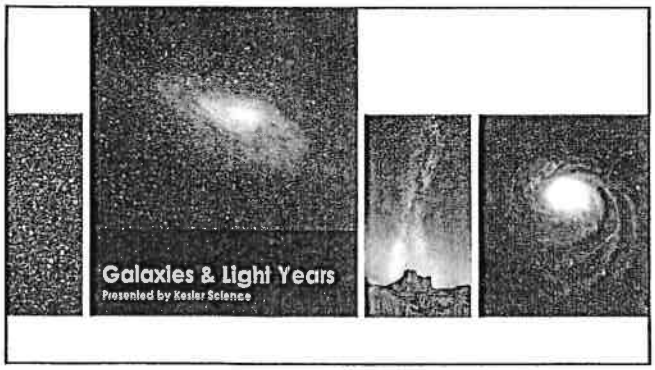
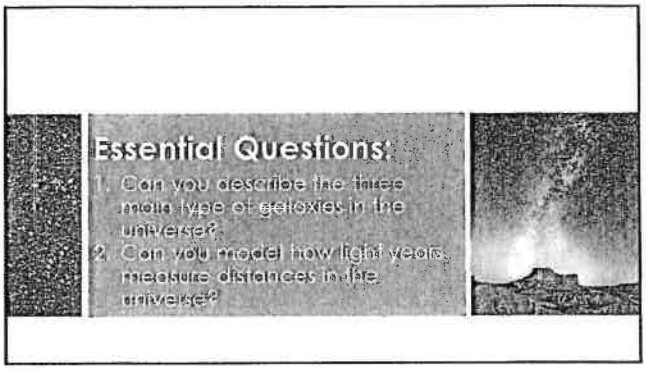
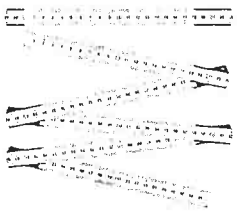




Light Years

Measuring Distances

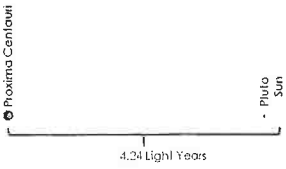
- Light Year – The distance light travels in one year.
- Light travels at 186,000 miles/sec or 671 million (6.71×10^8) miles/hour
- It takes 8.4 minutes for light to travel to the Earth



Light Years

Measuring Distances

- The closest star to the Sun is Proxima Centauri. It's 4.24 light years away.
- It takes 5.5 hours for the Sun's light to reach Pluto.



Quick Action - Light Years Model

Get with a partner and add the following data to the model below.

Object in Space	Time it Takes Light to Reach Object in Space
Barnard's Star	5.9 years
Luhman 16	6.59 years
Earth	8.4 minutes
Pluto	5.5 hours
Sirius A	8.58 years

Sun

8 Light Years

Quick Action - Light Years Model Answers

Object in Space	Time it Takes Light to Reach Object in Space
Barnard's Star	5.9 years
Luhman 16	6.59 years
Earth	8.4 minutes
Pluto	5.5 hours
Sirius A	8.58 years

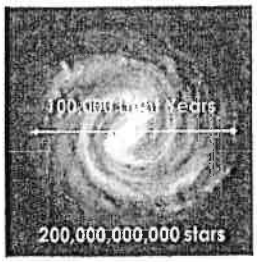
Sirius A
Luhman 16
Barnard's Star
Pluto
Earth
Sun

8 Light Years

Light Years and Galaxies

Galaxies

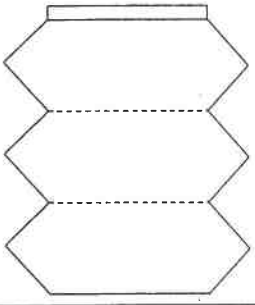
- A galaxy is a system of millions or billions of stars, made of gas and dust, held together by gravitational attraction.
- Galaxies are different sizes and shapes.
- How far is it across our own galaxy?
- How many stars are in the Milky Way?



Quick Action – Galaxies INB Template

Galaxies INB Template

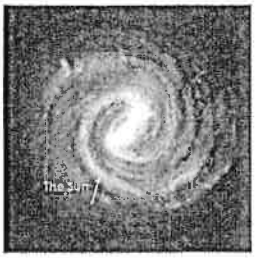
1. Cut out the template.
2. Glue it to your journal along the skinny tab.
3. Fold like an accordion along the dashed lines.



Galaxy Classification

Spiral/Disk Galaxy

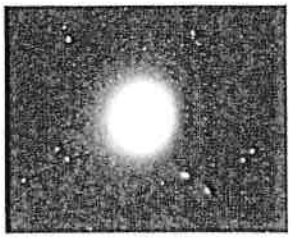
- Spiral or disk shaped
- Has 'arms'
- Dense center
- We live in a spiral galaxy called the Milky Way.
- Our Sun is located about 2/3 of the way out on one of the arms.



Galaxy Classification

Elliptical Galaxy

- Oval-shaped
- Most abundant galaxies in the universe
- Most are composed of older, low-mass stars



Galaxy Classification

Irregular Galaxy

- No defined shape
- No clear bulge or disk
- The leftovers of two colliding galaxies

Check for Understanding

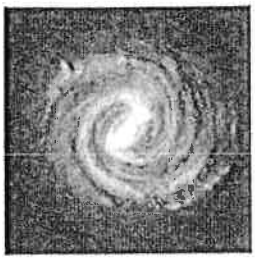
Write a short essay to answer the following questions.

1. What is a galaxy?
2. How are galaxies classified?
3. What are some characteristics of each galaxy?
4. Where is the sun located in our galaxy?

Check for Understanding

Can you...

1. Describe how galaxies are classified?
2. Describe different characteristics of each galaxy?
3. Model how light years measure distance in space?



Galaxies/Light Year Modified

Light Year

The _____light travels in a year.

The closest star to Earth is _____.

Galaxies

A _____ is a system of millions or billions of stars, with gas and dust, held together by gravitational attraction.

Spiral/Disk Galaxy

Spiral or disk shaped

Has _____

Dense center

We live in a spiral galaxy called the _____

Our Sun is located about _____of the way out on one of the arms.

Elliptical Galaxy

_____shaped

Most _____type of galaxy

Composed of _____stars

Irregular

No _____shape

No clear _____

Reading Science

Name: _____ Date: _____

The Universe

1 Gazing into the sky on a clear night, you'll see thousands of visible stars twinkle and shine. It seems like space and the stars go on forever, but what is really out there? Have you ever wondered if maybe we are not alone, and that a little green man might just land in your backyard? You are not the only one who has pondered this question. Scientists called astronomers have been studying the night sky since the beginning of time. They have a pretty good idea about what is out there and of what the universe consists. The universe, everything that exists, is composed of many objects like galaxies, stars, and nebulae.

2 The universe is home to billions of galaxies. Each galaxy can contain a few million to hundreds of billions of stars that are held together by gravity. Our galaxy, the Milky Way, is a spiral galaxy. A spiral galaxy forms new stars in its spiral arms. Our solar system is located in one of the spiral arms. On a clear, dark night, a milky band runs across the sky. This is the central portion of our galaxy. Including the Sun, the Milky Way contains approximately 200 billion stars. Along with spirals, another type of galaxy is called an elliptical galaxy. This type of galaxy is shaped like an oval. It contains old, red stars and does not have enough gas to create new stars. Some galaxies have an irregular shape and so are called irregular galaxies. These galaxies come in many shapes and sizes and are constantly forming new stars.

3 The universe is full of billions upon billions of stars. Peering into the night sky, you'll find it's hard to tell a difference among them. The twinkling light that you see at night may have been on its way to Earth for thousands, or maybe even millions, of years. The star's age and temperature determines what color of light we see. The hottest stars appear blue, while the coolest stars appear red. Stars range in size from smaller than Earth (neutron stars) to 500 hundred times larger than the Sun (red supergiants). When scientists classify stars, they use a scale called the Herztsprung-Russell diagram (HR diagram). Each star is placed on the diagram according to its luminosity and color. Astronomers are then able to learn more about the stars by the categories they are grouped in on the HR diagram.

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Reading Science

4 The universe is full of galaxies and stars, but what is in the black, empty space between them? Dust and gas, which help create new stars, form into clouds. The clouds, called nebulae, appear in a variety of shapes, sizes, and colors. An emission nebula appears to be a pinkish-red color. The hydrogen atoms inside the nebula emit a red light that makes the cloud glow. Reflection nebulae, just like its name, reflect the light of other stars. They appear to be blue. The effect is similar to what makes the sky appear blue on Earth. The nebula cloud scatters the blue light and lets the other colors of light pass through undisturbed. Dark nebulae seem to produce no light, because the stars are not close enough to them. They appear as a dark spot in space. A planetary nebula is a result of a star, like the Sun, expanding to become a red giant. Despite its name, it has nothing to do with the planets. It appears to have a colorful ring around it.

5 The universe is everything that exists. Astronomers believe that it could be about 13 billion years old. By studying the galaxies, stars, and nebulae that create stars, scientists understand more and more about how the universe came into existence. The next time you wonder if there really are little green men up in space, think about all the great astronomers who have studied the night sky in search of the same answer.

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Reading Science

1 Using the information in the passage, rank the types of galaxies by their ability to form new stars, from most to least activity.

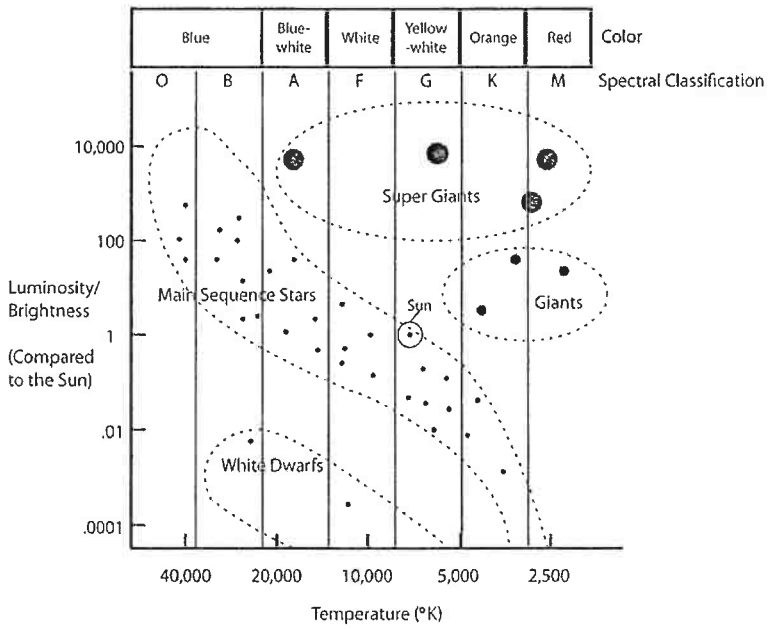
A Elliptical, spiral, irregular

B Irregular, elliptical, spiral

C Spiral, irregular, elliptical

D Irregular, spiral, elliptical

Hertzsprung-Russell (H-R) Diagram



2 Examine the Herztsprung-Russell diagram shown. Which category of stars has the greatest brightness?

A Main Sequence

B Supergiants

C Giants

D White Dwarfs

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Reading Science

3 The sky on Earth is blue because blue light is scattered through the atmosphere as the other colors of light pass through undisturbed. Which nebulae have something similar going on?

A Emission nebulae

B Dark nebulae

C Reflection nebulae

D Planetary nebulae

4 Paragraph 2 mentioned different types of galaxies. Scientists discovered a new octagonal galaxy. Based on the context, this galaxy is in the shape of a _____.

A octagon

B triangle

C rectangle

D elliptical

5 Complete the following analogy:

Reflection nebulae:blue as emission nebula:_____

A greenish-blue

B yellow

C red

D pinkish-red

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Science Today

Name: _____ Date: _____

Scientists: Earth's Galaxy Heading for Collision with Andromeda Galaxy

May 31, 2015
AP Video Archives

The latest cosmic discovery to come from the Hubble Space Telescope is one that is not likely to have a major impact in the near future, but billions of years from now, the Milky Way may disappear.

A science team at the Space Telescope Science Institute has used instruments on Hubble to measure movement in the Andromeda galaxy.

Astronomers in a NASA news conference in Washington on Thursday announced that observations from the Hubble Space Telescope detail a long-anticipated galactic smash-up.

Located some two and a half million light years away, Andromeda is our largest nearby galactic neighbour.

But, according to the calculations, Andromeda and our own galaxy, the Milky Way, are on a collision course at the rate of 250,000 miles an hour, and increasing as the two galaxies travel closer.

That means that some four billion years from now, the two galaxies will collide and merge, according to measurements made seven years apart by instruments on board the Hubble Space Telescope.

Scientists say the sun and Earth should easily survive what will be a 1.2 million mile per hour galactic merger, but likely will be in a different place in the cosmos.

"The distances between stars and galaxies are vast so when the two galaxies collide, the individual stars will not actually run into each other," Roeland van der Marel, from the Space Telescope Science Institute said.

"No individual star in Andromeda will directly hit our sun. And, in fact, it is unlikely that any star would even come close enough to significantly perturb the Earth's place in the solar system," he added.

According to NASA, there is no need to worry about when the world as we know it might end. It has calculated that our entire Milky Way galaxy will crash into a neighbouring galaxy with a head-on hit in four billion years.

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Science Today

Astronomers had seen the Andromeda galaxy coming at us, but thought there was a chance that its sideways motion would make it miss or graze the Milky Way.

Hubble readings now say there's no chance of that.

1. What is the article describing?

2. Why is it important?

3. When will it happen?

4. How will it affect the Earth?

5. What is causing this collision?

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