STARS

vocabulary / concept / model / application

small group activity

STARS

Ideal Unit: Solar System	**Time Range:** 1 Period	**Supplies:** Envelopes, Pencil & Paper

Topics of Focus: Life cycle of a star. Classification of stars. Constellations.

Procedures:

A.) You will need to determine the number of student groups you plan to have. This will work best with student groups of 3-5. You will need to have one set of envelopes and set of all the clues for each student group. You will need 4 envelopes for each student group. There are seven pages of clues. These will need to be cut apart in advance and placed in the correct envelopes. It would be wise to have an extra copy of this for you as teacher (not cut up).

B.) To begin, give each student group "Envelope 1". Students are given some pieces of clues that they will need later. Like in an Escape Room, this isn't always obvious. Let them struggle! If a group is falling behind, you can always provide a hint. After they have figured out how their clue fits together and solve the problems correctly. They will discover a "code". This is like a lock. Once they give you the correct code, you can give them their next envelop. If they are incorrect, you can make them wait 2 minutes before they can reapproach you. Can students escape the topic before time runs out? We'll find out.

As an option, you can use the Escape Class app for interactive locks! See the next page for links and the Class Code!

Options.) Should you want to have alternate endings, although the docs are not editable, you can use teacher magic tricks to change numbers to make different codes. I wouldn't recommend this until you've done the activity a few times. You may also find it works well to laminate the cutout and number them on the back with the envelope they are supposed to go in.

FOR INTERACTIVE LOCKS

CLASS CODE: 9-7-6-3

WANT A SPOOKY COUNTDOWN TIMER?

HTML

ESCAPE COUNTDOWN

CLICK THE BUTTONS TO GO THERE!

THE STORY

As an option, you can read this to your class to prepare them for the activity.

You've been taken in the middle of an ordinary day and are now locked in a science class. This isn't your fault – this is what the law tells us needs to happen. Unfortunately you are not allowed to leave until you have an understanding of stars. You have ____ minutes to do so.

There are four sets of envelopes with clues. You must determine the correct code to receive the next envelope. If you cannot Escape Science in the time allowed, you will be stuck in here forever.

VOCABULARY

Cut into 20 pieces **ENVELOPE 1**

Answer: as displayed

a. Black Hole	9. The core of a supermassive star that remains after a supernova; it has gravity so strong light cannot escape it.
b. Constellation	7. A group of stars that form a pattern.
c. Gravity	1. A force of attraction between objects.
d. Main sequence star	4. A star that is fusing hydrogen atoms to helium; a star in the main portion of its life.
e. Nebula	3. A cloud of gas and dust in other space. They are places that new stars are beginning to form.
v. Neutron Star	0. The smallest of all the stars that forms after a star collapses after a supernova but is not massive enough to create a black hole.
w. Plasma	8. The fourth state of matter that makes up stars and occurs when a super heated gas sheds its electrons.
x. Red Supergiant	5. An extremely large, aging, giant star.
y. Supernova	6. A huge explosion caused when a star collapses on itself.
z. Universe	2. Everything that exists, including all matter, energy, space, and time.

Cut out and place in **ENVELOPE 1**

1 VOCABULARY

Match the word with the definition. Substitute the numbers from the definition in for the correct letter. Simplify the expressions to get the four digit code.

a – b – c	d + e	v + w	x + y – z
9 – 7 – 1 = 1	4+3=7	0+8=8	5+6-2=9

Answer: Code to receive Envelope 2 (1-7-8-9)

Canis Major 2

A constellation in the Southern Sky that means "the greater dog" in Latin. It represents the famed Greek dog Laelaps. It is notable because it contains the brightest star in the night sky, Sirius.

Cassiopeia 1

A constellation in the Northern Sky named after a vain queen in Greek mythology who boasted about her beauty. With its distinctive "W" shape, it is one of the most easily found constellations in the night sky.

Orion 4

A constellation located on the celestial equator. Named after a gifted hunter, it is one of the largest constellations. It is visible around the world and has been mentioned by Homer and the Bible. Its belt of three stars is the easiest to find.

Scorpio 1

A constellation of the zodiac. Orion boasted that he could kill all the animals on the earth, but he encountered this species that defeated him. Antares, the brightest star in the constellation, is said to be its "heart."

Taurus 2

A constellation of the zodiac that is located in the Northern Hemisphere's winter sky. It has several myths involving it. The constellation forms a prominent "V," which represents the head and horns of the bull.

2 HEY CONCEPTS

Arrange the names, images and descriptions to complete a short overview of a constellation. Each match will have exactly six dots between the three pieces. Use the icons on the descriptions and the special numbers to find your next clue.

Cut into 16 pieces and put in

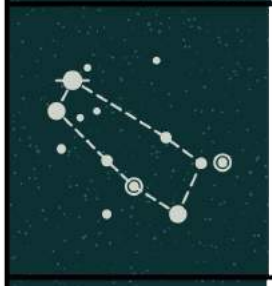
ENVELOPE 2

Ursa Major 1

The Big Dipper is thought of as a constellation, but it is just a part of this constellation. Its name translates to "greater she-bear" in Latin. It is perhaps the most recognized constellation and is always visible in the Northern Hemisphere.

Ursa Minor 5

A constellation in the Northern Sky better known as the Little Dipper. It is famous for containing Polaris, the North Star. Its name in Latin translates to "the Little Bear," and it is a constellation in the Northern Sky.

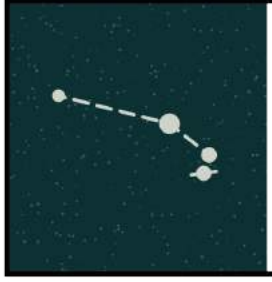


Gemini 3

A constellation of the zodiac that is located in the Northern Hemisphere. It represents the twins Castor and Pollux, which are the names of its brightest stars. These stars have lines forming their bodies, giving the constellation a "U" shape.

Leo 1

One of the earliest recognized constellations, even documented by the Mesopotamians. The "pointer stars" of the Big Dipper point to it. It becomes visible in the Northern Hemisphere around the spring equinox and is identifiable through May.



Aries 4

A constellation of the zodiac that is located in the Northern Hemisphere. The Greeks and Egyptians traditionally associated the constellation with a ram. It is a midsize constellation that's not particularly luminous

ESCAPE SCIENCE

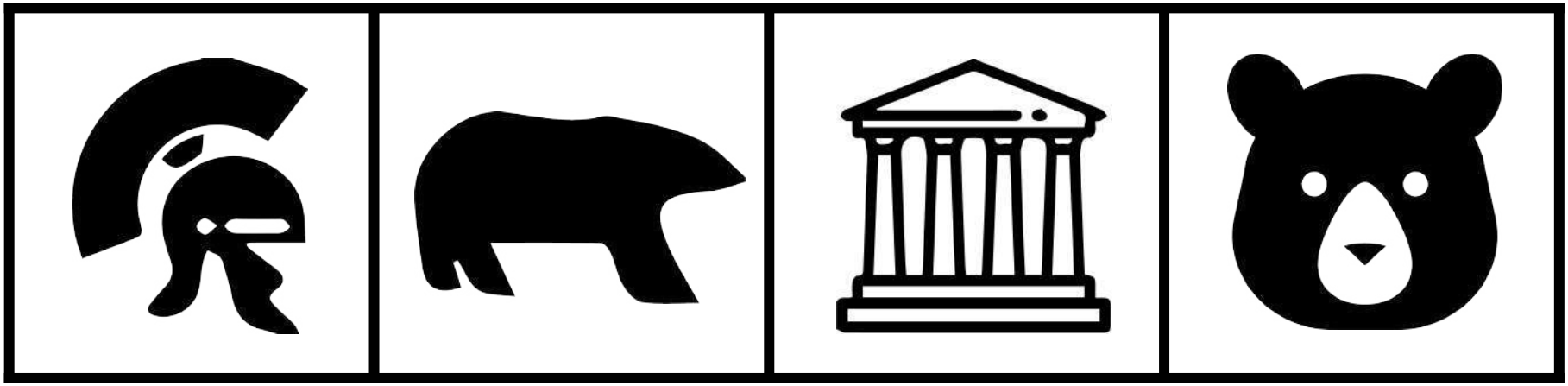
CONSTELLATIONS

Cut into 15 pieces and put in

ENVELOPE 2

CONSTELLATION CODE

Cut out and place in **ENVELOPE 2**



Add the special numbers from the biomes with these icons to construct a code.

4+1=5 2+2+1+4=9 1+3=4 1+5=6

Answer: Code to receive Envelope 3 (5-9-4-6)

Cut and place into
ENVELOPE 3

IMAGE & CLUE

Piece together the two parts to the image.
Find the clue.
How many letters are in this sign's name?

This info (?) is needed for the MODEL puzzle.

Cut and place into **ENVELOPE 3**

Cut and place into
ENVELOPE 3

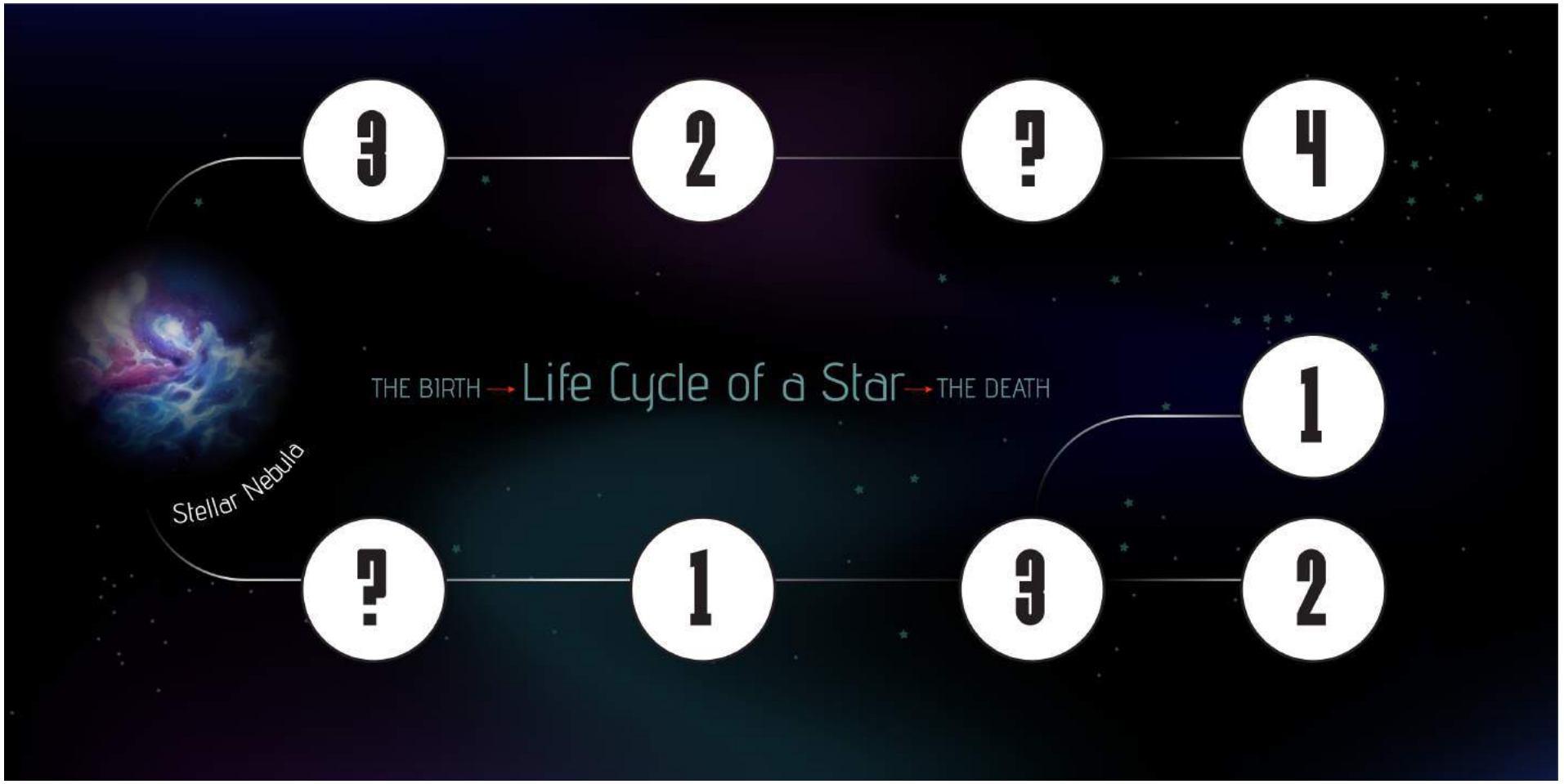
The seventh sign of the zodiac. If you were born in late September or early October, you likely have this sign of justice.

LIBRA
Answer: 5 letters

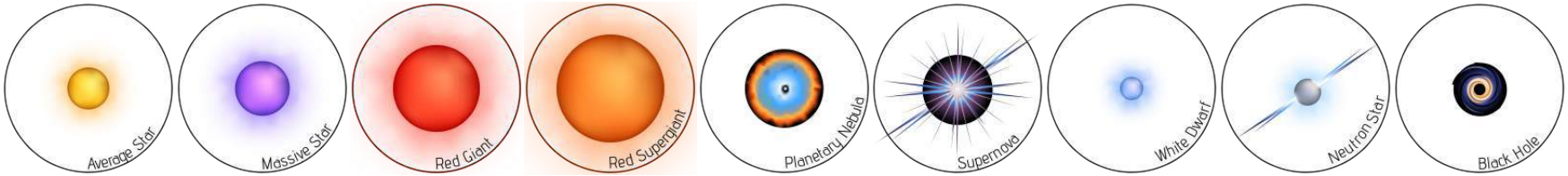
Cut and place into **ENVELOPE 2**

LIFE CYCLE

Cut out and place in **ENVELOPE 3**



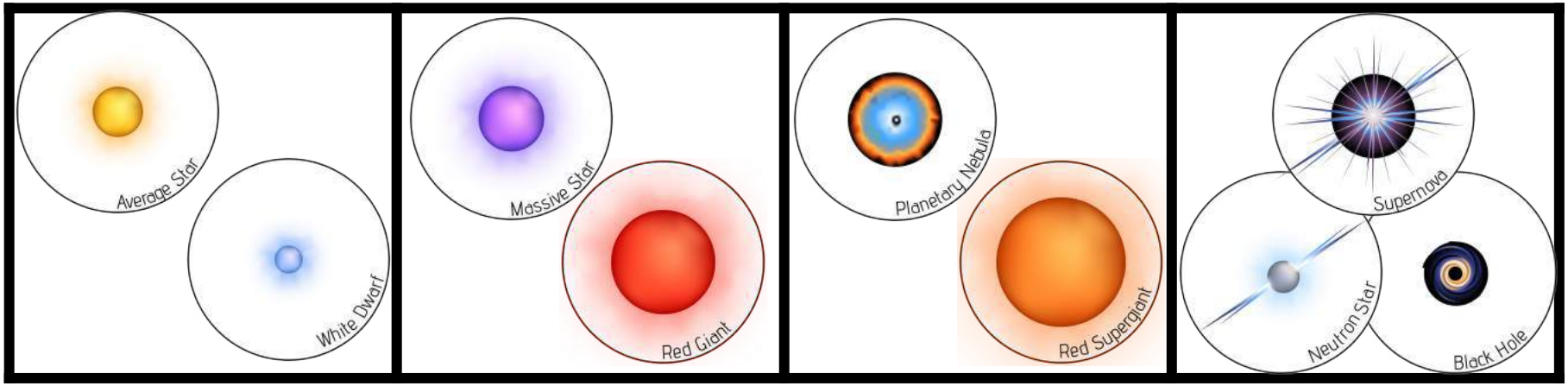
Optional icons to cut and place



Cut out and place in **ENVELOPE 3**

3 MODEL

Add the numbers in the diagram for each of these four stages.
If you do this correctly, you will discover **a four digit code**.



3+4=7

5+2=7

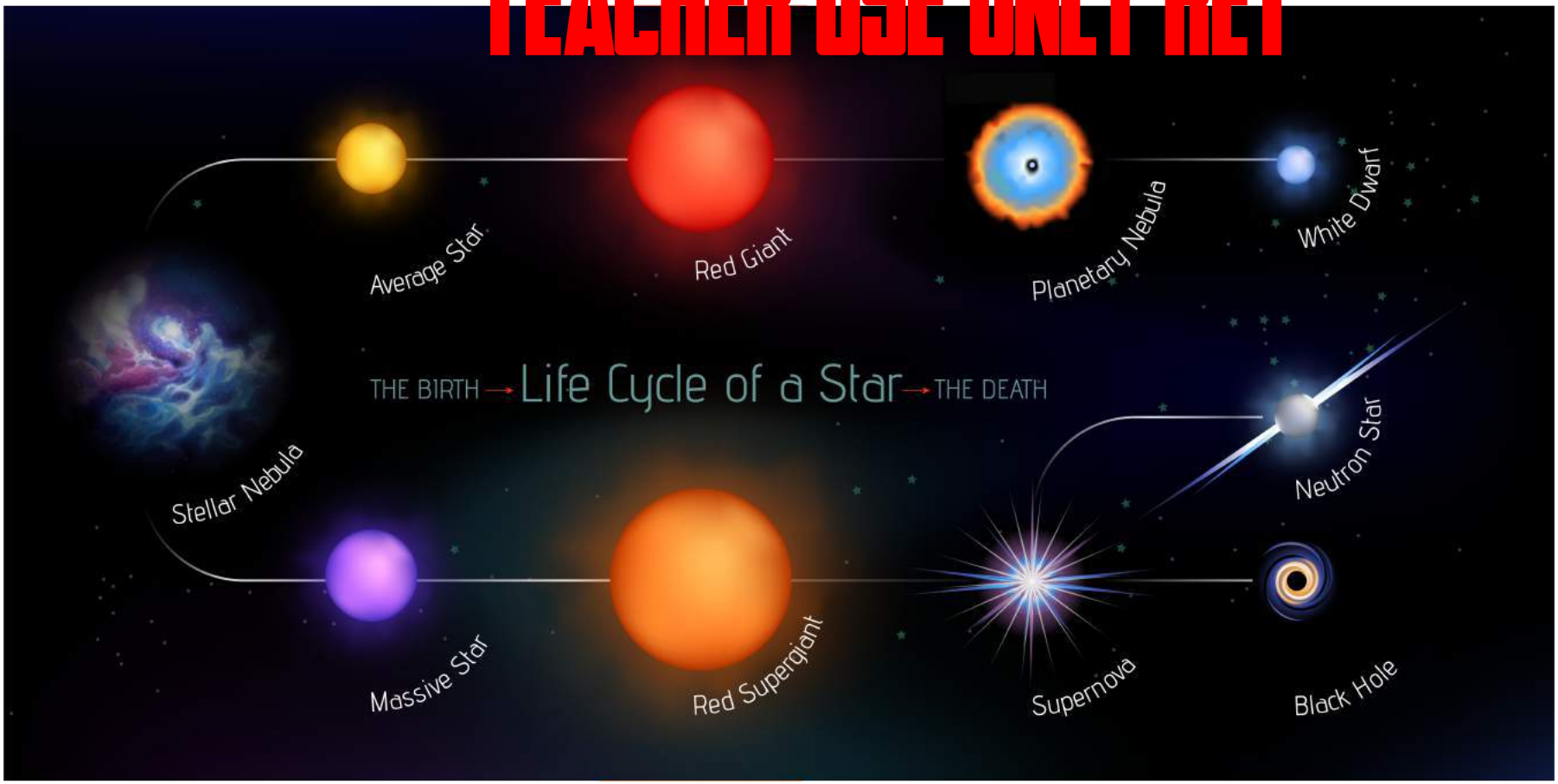
5+1=6

3+1+2=6

Answer: Code to receive Envelope 4 (7-7-6-6)

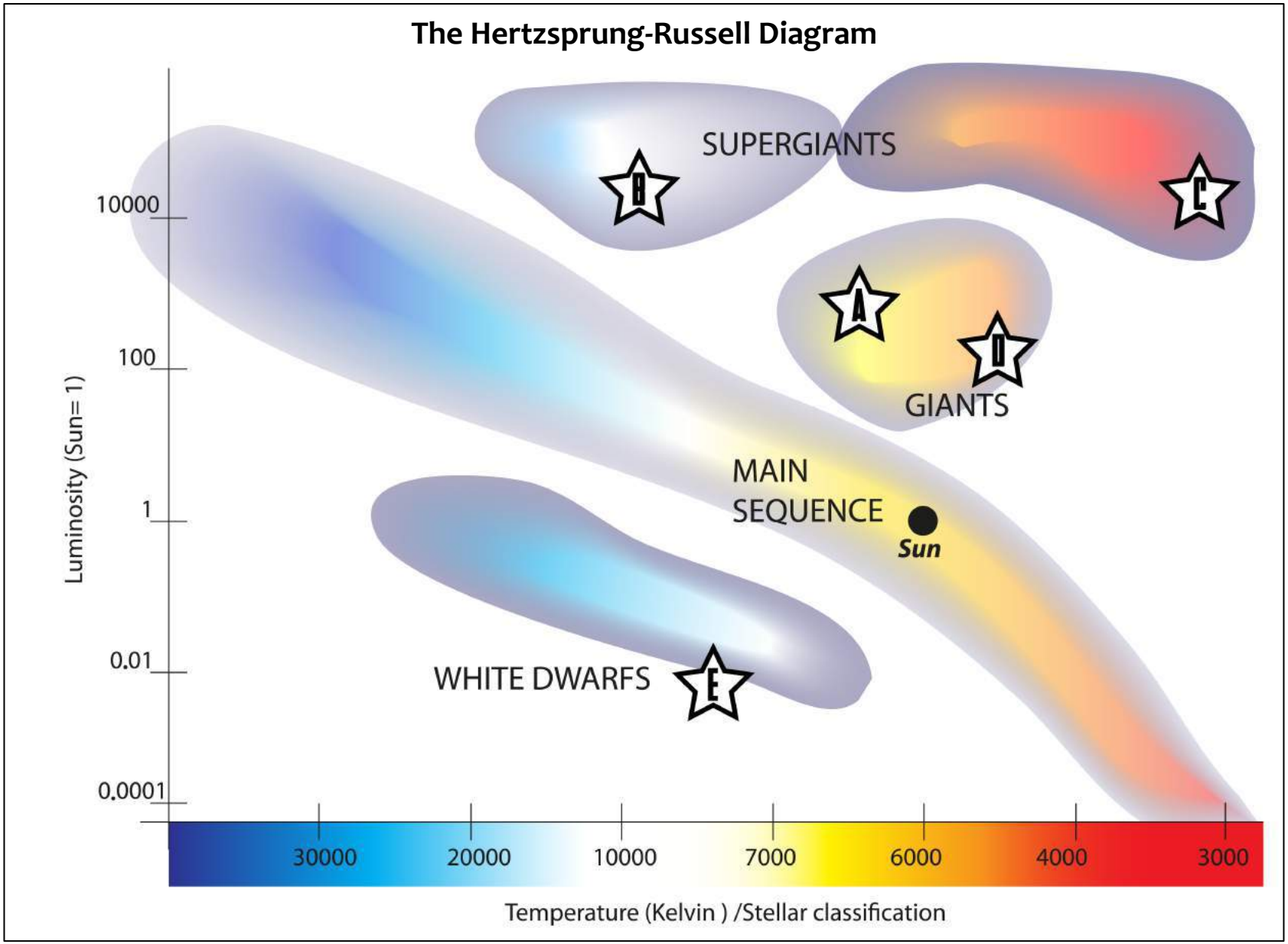
ESCAPE SCIENCE

TEACHER USE ONLY HEY



FINAL CHALLENGE

Cut out and place in Envelope 4.



FINAL CHALLENGE STARS

Cut into 9 pieces. You can place the stars in four different envelopes. Students will need to collect them. The directions MUST be put in Envelope 4. Alternatively, you can put them all in Envelope 4.

CODE TO WIN (2-7-9-4-3). The last three stars are extra.

POLARIS 2

A yellow giant with a temperature of 6,750 K and an average luminance of 1,000 times brighter than the sun.

RIGEL 7

A white supergiant with a temperature of14,250 K and an average luminance of 50,000 times brighter than the sun.

ANTARES 9

A red supergiant with a temperature of 3,500 K and an average luminance of 10,000 times brighter than the sun.

ARCTURUS 4

An orange giant with a temperature of 4,250 K and an average luminance of 100 times brighter than the sun.

SIRIUS B 3

A white dwarf with a temperature of 8,500 K and an average luminance of 0.01 of the sun.

4 FINAL CHALLENGE

Determine which stars are in the Hertzsprung-Russell Diagram. The final **five digit code** is in the order A-B-C-D-E. If you can do this, you may, just may --

DIRECTIONS

10 LACERTRA 8

A blue supergiant with a temperature of 25,000 K and an average luminance of 1,400,000 times brighter than the sun.

SPICA 6

A bluish white main sequence star with a temperature of 19,973 K and an average luminance of 800 times brighter than the sun.

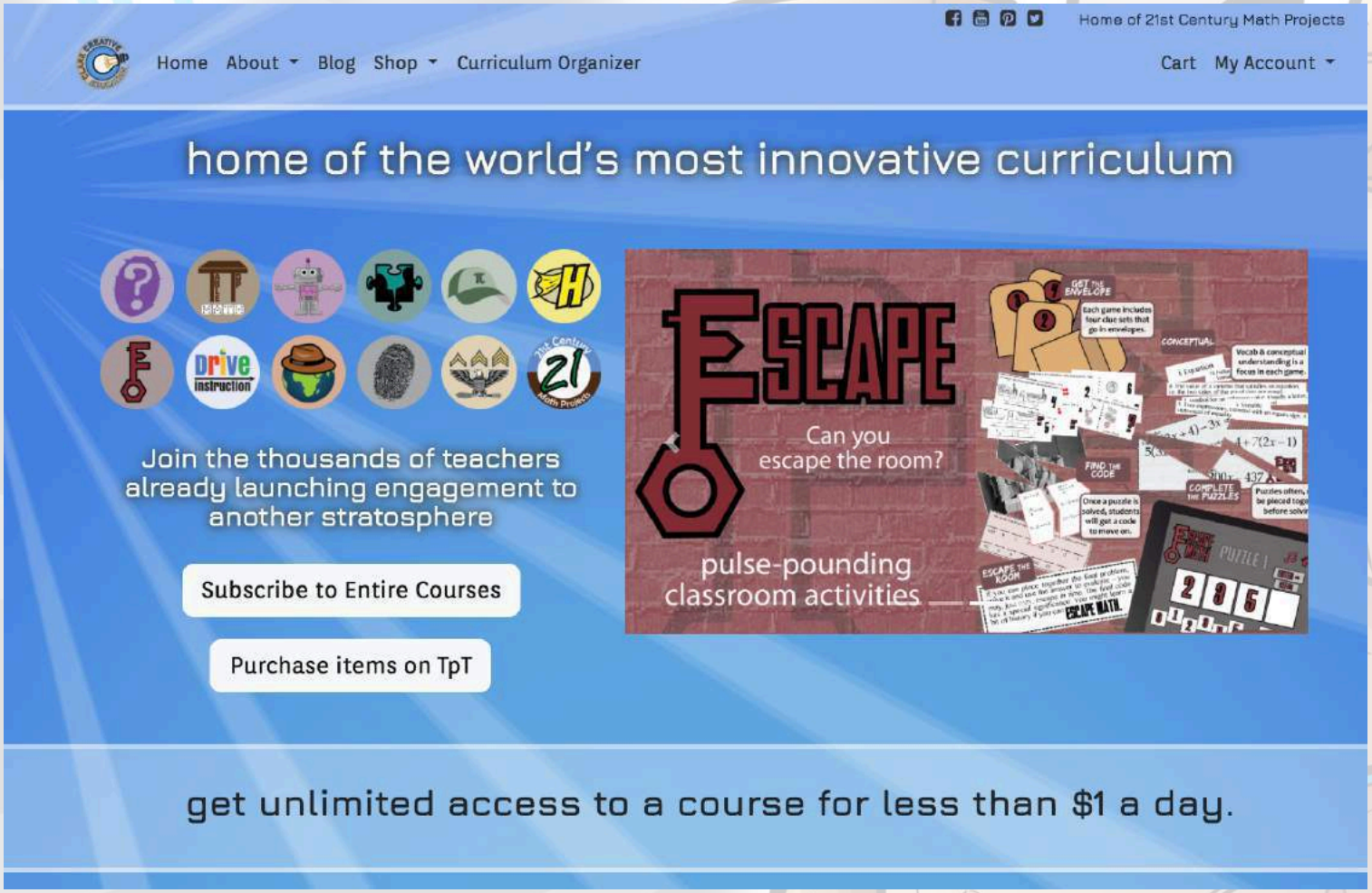
TAU CETI 5

An orange main sequence star with a temperature of 5,275 K and an average luminance of 0.5 of the sun.

I HAVE

Interested in Unlimited Access?

Click to visit www.clarkcreativeeducation.com



Use Couponcode: tpter For 25% off any subscription

Terms of Use

This product includes a license for **one** teacher only for personal use in their classroom. Licenses are **non-transferable**, meaning they can not be passed from one teacher to another. No part of this resource is to be shared with a colleague or used by an entire grade level, school, or district without purchasing the proper number of licenses. If you are a coach, principal, or district interested in transferable licenses to accommodate yearly staff changes, please contact me for a quote at teach@clarkcreativeeducation.com

This resource or answers to the questions may not be uploaded to the internet where it is publicly available in any form including classroom/personal websites, network drives or student Prezis (which can be made private), unless the site is password protected and can only be accessed by students.

Thank you for respecting my work!