Astronomy

Review

and

Reinforce

Chapter 4

Stars, Galaxies, and the Universe

_____

Name

_____

Homeroom

Name _____ Date _____ Class _____

108-111

Is There Life Beyond Earth?

Understanding Main Ideas

Answer the following questions. Use a separate sheet of paper if you need more room.

1. What are three characteristics that all living things on Earth have in common?

2. What does the phrase "Goldilocks conditions" refer to?

3. What are the three "Goldilocks conditions"?

4. Scientists have discovered unusual life forms on Earth, such as animals that live in the ocean at very high pressure and in the dark, and other animals that get their energy from chemicals. Using this information, what do scientists infer about the conditions necessary for life on other planets?

5. Spacecraft sent to Mars have found regions on the planet's surface that look like streambeds. Why do these regions lead scientists to hypothesize that there may have once been life on Mars?

6. Why do scientists think that Europa might have the conditions for life to develop?

Building Vocabulary

Write a definition for the following term on the line below.

7. extraterrestrial life

1.

Name _____ Date _____ Class _____

70-115

Key Terms

Clues

Answer the questions by writing the correct key terms in the blanks. Use the circled letters to find the hidden key term. Then write a definition for the hidden key term.

1. What is the name of the sun's surface layer?
   _ ○ _ _ _ _ _ _ ○ _ _
2. What is an elongated circle, or oval shape, called?
   _ _ ○ _ _ _ _
3. What are the objects called that orbit the sun in a belt between Mars and Jupiter?
   _ _ _ _ _ _ ○ _ _
4. What is the trapping of heat by the atmosphere?
   _ _ _ _ _ _ ○ _ _ _ _ _ _ _ _ _ _ _
5. What is a description of the solar system in which all the planets revolve around Earth?
   _ _ _ ○ _ _ _ _ _ _ _
6. What is a chunk of rock or dust in space called?
   _ _ _ ○ _ _ _ _ _ _
7. What are reddish loops of gas that connect different parts of sunspot regions?
   _ _ _ _ _ ○ _ _ _ _ _ _
8. What are areas of gas on the sun that are cooler than the gases around them?
   _ _ _ _ _ _ ○ _
9. What is a stream of electrically charged particles sent out by the corona called?
   _ _ _ _ ○ _ ○ _ _
10. What is the outer layer of the sun's atmosphere?
    ○ _ _ _ _ _

Key Term: _ _ _ _ _ _ _ _ _ _ _ _ _ _

Definition:

_____

_____

3

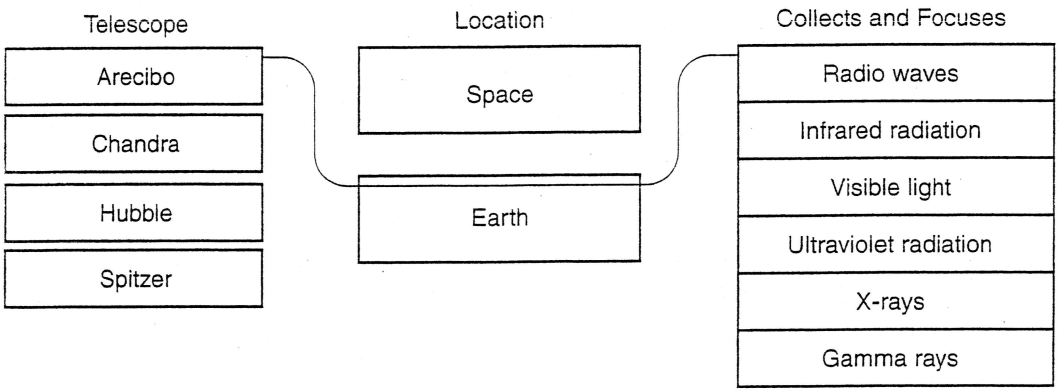
Name _____ Date _____ Class _____

Telescopes

118-124

Understanding Main Ideas

For each tool on the left, draw a line that connects it with its function. Then continue the same line to connect the tool and function with the type of electromagnetic radiation that the tool uses. Some functions and types of electromagnetic radiation will have more than one line connecting them. The first one is done for you.



1. What is electromagnetic radiation?

_____

_____

Building Vocabulary

Match each term with its definition by writing the letter of the correct definition in the right column on the line beside the term in the left column.

____ 2. telescope

____ 3. spectrum

____ 4. observatory

____ 5. wavelength

____ 6. visible light

____ 7. convex lens

a. a building that contains one or more telescopes

b. the portion of the electromagnetic spectrum that humans can see

c. white light shining through a prism spreads out to form this

d. a device built to observe distant objects by making them appear closer

e. a piece of transparent glass, curved so that the middle is thicker than the edges

f. the distance between the crest of one wave and the crest of the next wave

6

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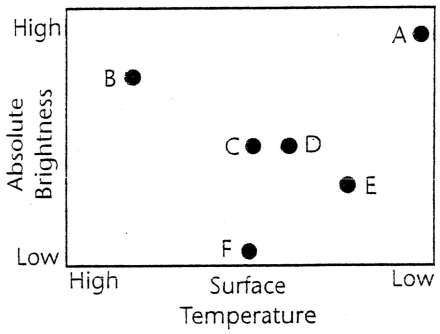
126-133

Characteristics of Stars

Understanding Main Ideas

Use the H-R diagram on the right to answer questions 1–3. Write your answers in the spaces provided.



____ 1. Which star has the greatest brightness?

____ 2. Which star has the hottest surface?

3. Stars C and D have the same absolute brightness. What would you need to know to determine their apparent brightnesses?

_____

Answer the following questions on a separate sheet of paper.

4. Explain how astronomers measure the distance to nearby stars.
5. What are the main characteristics used to classify stars?
6. How would you classify the sun based on each of these characteristics?

Building Vocabulary

From the list below, choose the term that best completes each sentence and write it in the space provided.

spectrograph	parallax	Hertzsprung-Russell diagram
constellation	apparent brightness	main sequence
light-year	absolute brightness	

7. A star's brightness as if it were a standard distance from Earth is its _____.
8. A device that breaks light into colors and produces an image is a(n) _____.
9. A unit that is often used to measure distances between stars is a(n) _____.
10. The region of the Hertzsprung-Russell diagram that most stars fall within is the _____.
11. A graph of stars showing surface temperature on the *x*-axis and absolute brightness on the *y*-axis is a(n) _____.
12. _____ is often used to determine the distance to nearby stars.
13. A _____ is a(n) imaginary pattern of stars.
14. The brightness of a star as seen from Earth is its _____.

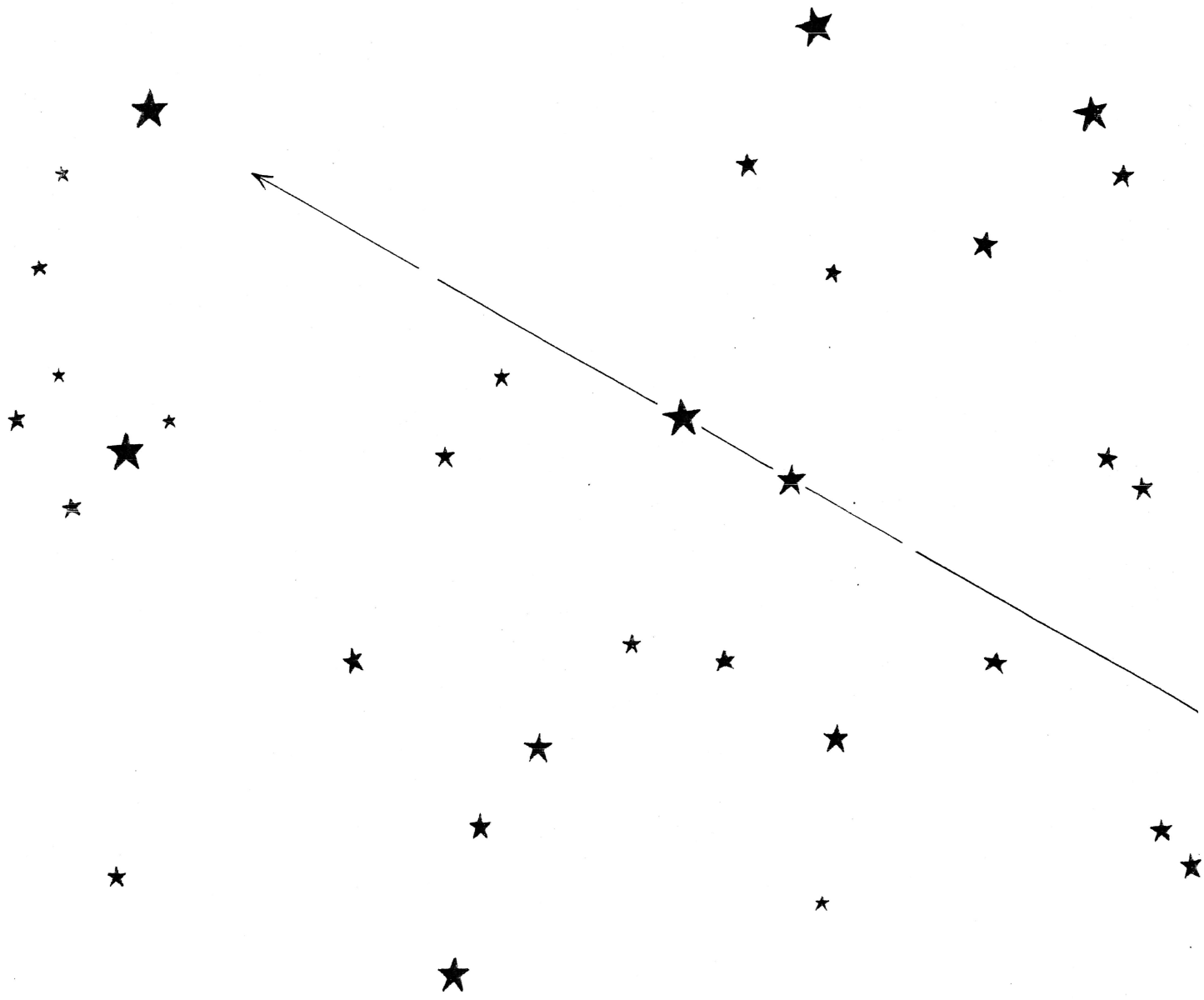
7

The North Star

Name_____

Because the Earth rotates, all the stars in the sky appear to move from east to west. Because Polaris is directly above the North Pole it does not move, and so i also called the North Star.

Polaris is found in the constellation Ursa Minor, also called the Little Dipper. The Big Dipper is found in the constellation Ursa Major, also called the Great Bear. Trace the Big Dipper and Little Dipper. Label Polaris.



WORD BANK

Big Dipper Little Dipper Polaris

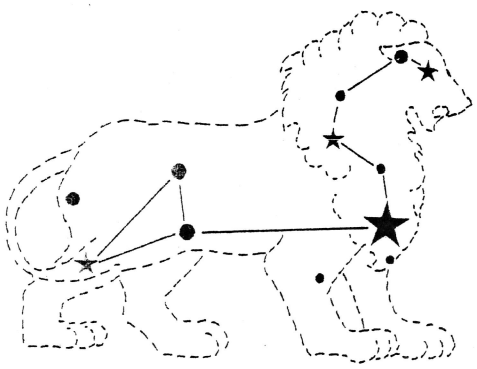
8

Pictures in the Night Sky

Name _____

For thousands of years people from every culture have gazed into the night sky and imagined groups of stars outlining a picture. These star pictures, called **constellations**, are like giant dot-to-dot puzzles in the night sky.

Name these well-known constellations.



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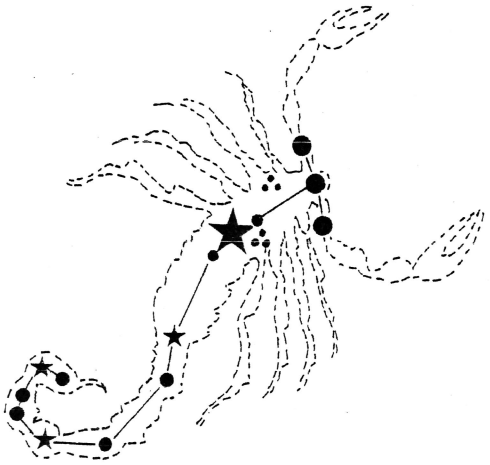

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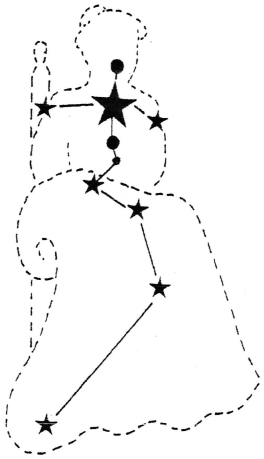

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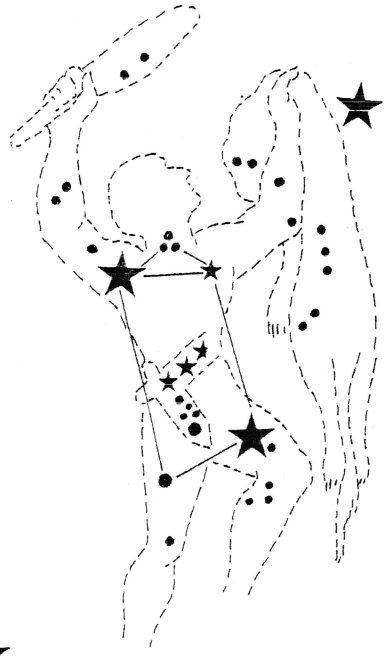

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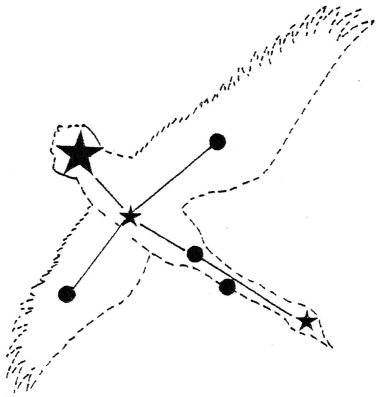

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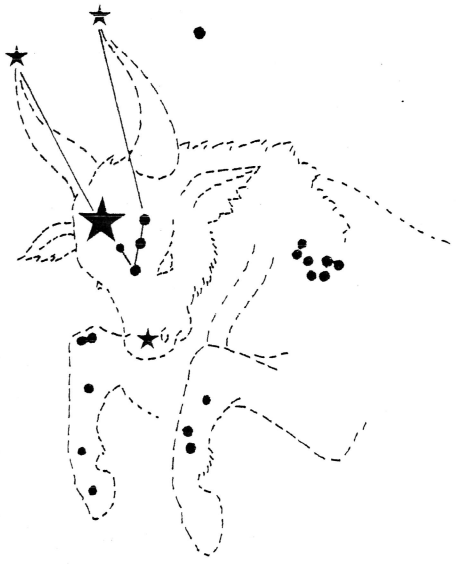


_____

WORD BANK

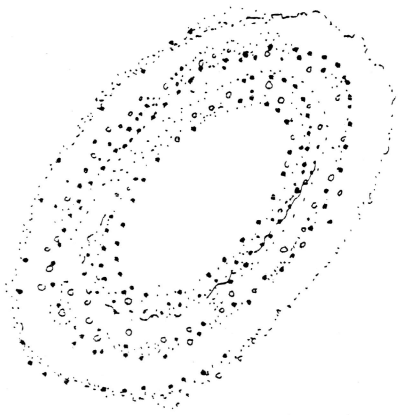
Orion	Cygnus	Leo
Scorpio	Taurus	Cassiopeia

9

Galaxies

Name_____

Beyond our galaxy lie billions of other galaxies. Use the **WORD BANK** to label the shapes of some of these galaxies.



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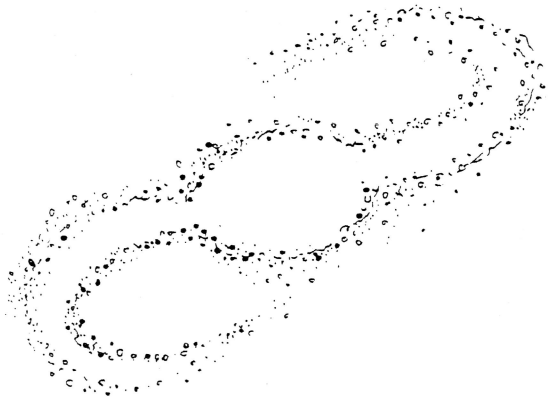

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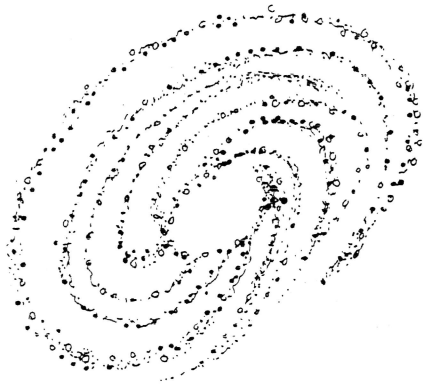

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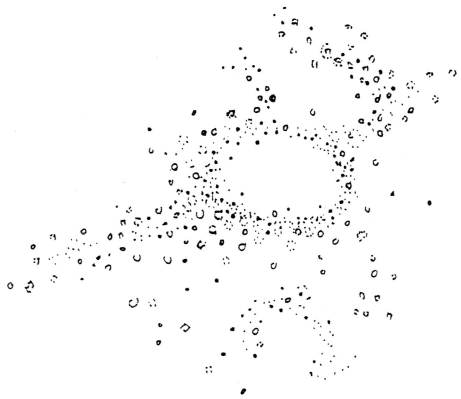


_____

WORD BANK

elliptical spiral barred spiral irregular

The Expanding Universe

Understanding Main Ideas

Write an answer for each of the following questions in the spaces provided.

1. In which direction are nearly all galaxies moving?

_____

2. What is Hubble's law?

_____

3. Explain how the sun was formed.

_____

_____

_____

_____

_____

Building Vocabulary

Match each term with its definition by writing the letter of the correct definition in the right column on the line beside the term in the left column.

____ 4. big bang

____ 5. cosmic background radiation

____ 6. dark energy

____ 7. planetesimal

____ 8. dark matter

____ 9. solar nebula

a. a force that is causing the expansion of the universe to accelerate

b. the asteroid-like bodies that formed the building blocks of planets

c. leftover thermal energy from the big bang

d. matter that does not give off electromagnetic radiation

e. a large cloud of gas and dust, such as the one that formed our solar system

f. a theory that the universe formed in a huge explosion

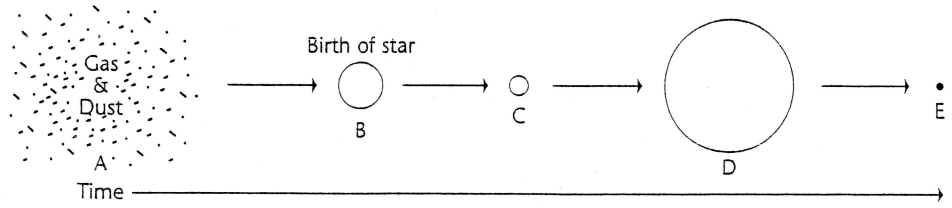
11

Lives of Stars

136-140

Understanding Main Ideas

Fill in each blank with the correct letter from the diagram.



____ 1. Red giant or supergiant

____ 2. Where fusion begins

____ 3. Part of a nebula

____ 4. White dwarf, neutron star, or black hole

____ 5. The stage the sun is in

Fill in the blank.

6. How long a star lives and what it becomes at the end of its life depend primarily on its _____.

Building Vocabulary

From the list below, choose the term that best matches each phrase.

____ 7. pulsar

____ 8. white dwarf

____ 9. nebula

____ 10. protostar

____ 11. supernova

____ 12. neutron star

____ 13. black hole

a. exerts such a strong gravitational pull that no electromagnetic radiation can escape

b. a large cloud of gas or dust in space

c. what a medium-mass star becomes at the end of its life

d. the earliest stage of a star's life

e. appears to emit pulses of radio waves

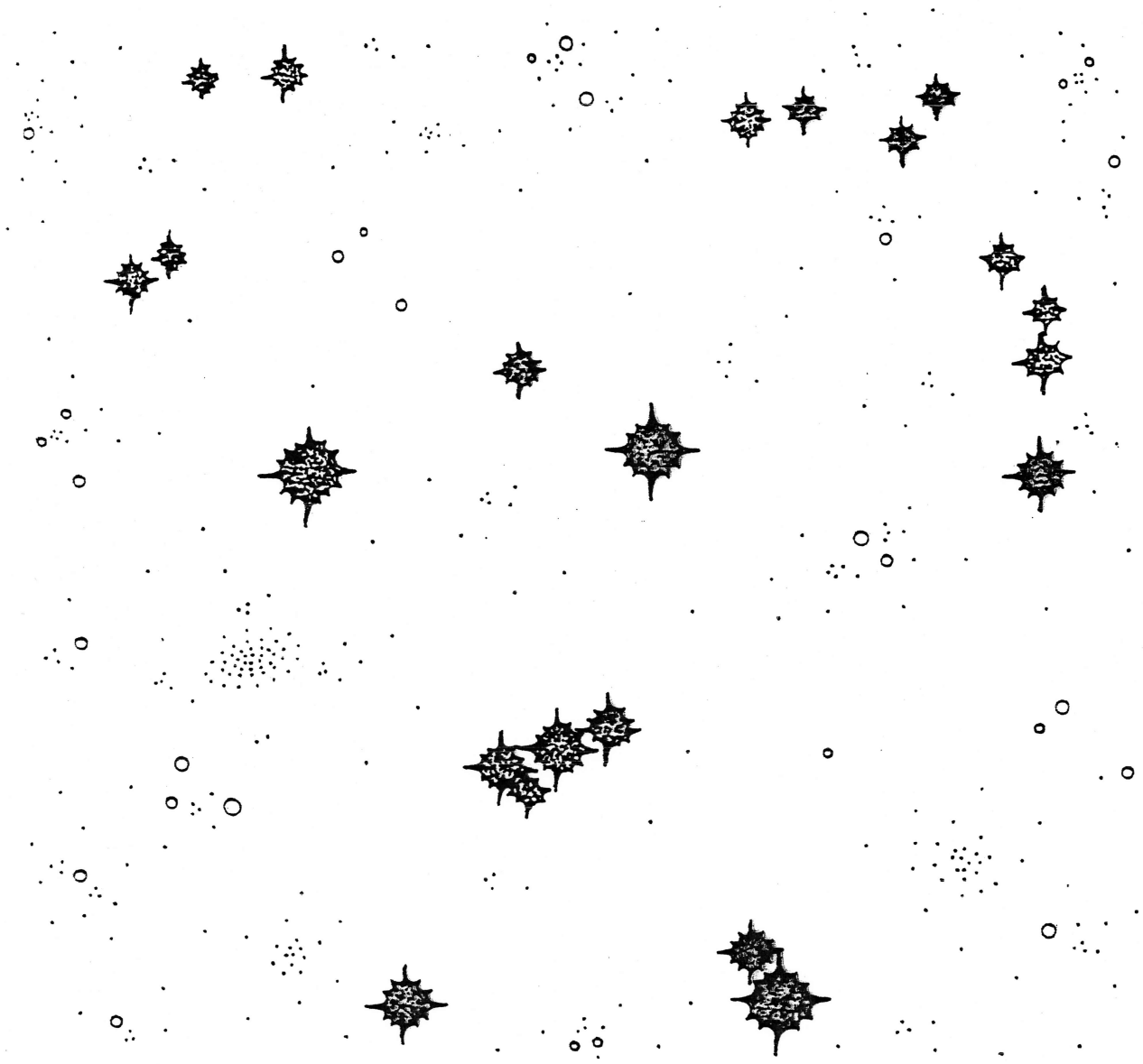
f. formed from the leftover material after a giant star explodes; may contain as much as three times the mass of the sun

g. an explosion that occurs at the end of a giant star's life

13

Name _____ Date _____

Exploring the Night Sky



The stars on this page form a constellation called Orion. Does the pattern suggest anything to you? Draw a picture that uses all the stars as points on a person, animal, or object.