

MCMS
7th Grade
NTI Packet
Day 16

MCMS

7th Grade Math

NTI Day #16

Name _____ Date _____ Class _____

LESSON 5-9

Reteach

Scale Drawings and Scale Models

The dimensions of a scale model or scale drawing are related to the actual dimensions by a *scale factor.* The **scale factor** is a ratio.

The length of a model car is 9 in. ⟶ $\frac{9 \text{ in.}}{162 \text{ in.}} = \frac{9 \div 9}{162 \div 9} = \frac{1}{18}$
The length of the actual car is 162 in. ⟶

$\frac{9}{162}$ can be simplified to $\frac{1}{18}$.

The scale factor is $\frac{1}{18}$.

If you know the scale factor, you can use a proportion to find the dimensions of an actual object or of a scale model or drawing.

- The scale factor of a model train set is $\frac{1}{87}$. A piece of track in the model train set is 8 in. long. What is the actual length of the track?

$\frac{\text{model length}}{\text{actual length}} = \frac{8}{x}$ $\quad \frac{8}{x} = \frac{1}{87}$ $\quad x = 696$

The actual length of track is 696 inches.

- The distance between 2 cities on a map is 4.5 centimeters. The scale on the map is 1 cm = 40 miles.

$\frac{\text{distance on map}}{\text{actual distance}} = \frac{4.5 \text{ cm}}{x \text{ mi}} = \frac{1 \text{ cm}}{40 \text{ mi}}$ $\quad \frac{4.5}{x} = \frac{1}{40}$ $\quad x = 180$

The actual distance is 180 miles.

Identify the scale factor.

1. Photograph: height 3 in.
   Painting: height 24 in.

$\frac{\text{photo height}}{\text{painting height}} = \frac{\text{in.}}{\text{in.}} = \frac{\quad}{\quad}$

2. Butterfly: wingspan 20 cm
   Silk butterfly: wingspan 4 cm

$\frac{\text{silk butterfly}}{\text{butterfly}} = \frac{\text{cm}}{\text{cm}} = \frac{\quad}{\quad}$

3. On a scale drawing, the scale factor is $\frac{1}{12}$. A plum tree is 7 inches tall on the scale drawing. What is the actual height of the tree?

_____

4. On a road map, the distance between 2 cities is 2.5 inches. The map scale is 1 inch = 30 miles. What is the actual distance between the cities?

_____

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Name _____ Date _____ Class _____

LESSON 5-9

Practice B

Scale Drawings and Scale Models

Identify the scale factor.

1.

	Alligator	Toy Alligator
Length (in.)	175	7

_____

2.

	Airplane	Model
Length (ft)	24	3

_____

3.

	Car	Toy Car
Length (ft)	13.5	1.5

_____

4.

	Person	Action Figure
Height (in.)	66	6

_____

5.

	Boat	Model
Length (in.)	128	8

_____

6.

	Fish	Fishing Lure
Length (in.)	18	2

_____

7.

	Tiger	Stuffed Animal
Length (in.)	70	14

_____

8.

	House	Dollhouse
Height (ft)	39.2	2.8

_____

9. On a scale drawing, a school is 1.6 feet tall. The scale factor is $\frac{1}{22}$. Find the height of the school. _____

10. On a road map of Pennsylvania, the distance from Philadelphia to Washington, D.C., is 6.8 centimeters. What is the actual distance between the cities if the map scale is 2 centimeters = 40 miles? _____

11. On a scale drawing, a bicycle is $6\frac{4}{5}$ inches tall. The scale factor is $\frac{1}{6}$. Find the height of the bicycle. _____

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7th Science
NTI 16 (2 pages)

Name _____ Class period _____

The Atmosphere a blanket of air that makes life possible on Earth.

In space near the Earth temperatures can vary between 248 degrees and -148 degrees Fahrenheit. This drastic change in temperature depends if your directly in the sun's rays or in the shade. Drastic changes like this wouldn't allow for the life of complex living things like humans.

Think of how an astronaut goes into space and all of the protective gear that they must wear for survival, there is no oxygen to breathe in space, they are heated or air conditioned depending on the temperature of space, and the strong radiation in space from the sun can also kill you. The atmosphere provides people on earth with all of these, making our environment comfortable for us to live in. It has the oxygen we need to breathe, regulates the temperature, protects us from harmful radiation, and even recycles and cleans our water.

An **atmosphere** is a layer of gases surround a planet or moon, which are held in place by gravity. The planets nearest to Earth, Mars and Venus contain gasses that would be toxic to humans. There are even some planets that are entirely made of atmosphere like Jupiter and the other gas giants in our solar system. So far the only place with an atmosphere that allows for life is Earth.

The atmosphere wraps around the earth in many layers like when you bundle up to go out in the cold. The layer on the surface of the earth is called the **troposphere** it reaches about 7 miles above the earth. It is the layer where all the weather and clouds can be found, it is where the water cycle happens. It is also the densest meaning the gas molecules are closest together here. The next layer as you fly up is the **stratosphere** it extends to around 30 miles from the surface, most commercial planes fly at the bottom of this layer where the air is thinner and weather doesn't impact the flight. This is the layer where you can find **ozone layer** which protects us on the surface by blocking out majority of the sun's harmful ultraviolet radiation (cancer causing UV rays). Scientists are concerned with the chemicals humans have been putting out into the air mixing with the ozone layer and thinning it causing the blocking of UV rays to be reduced. A reduction of these chemicals was agreed upon by the international community in 1985 banning the use of CFC's which were commonly used in refrigerants, propellants for aerosols, for generating foamed plastic like styrofoam. A reduction in these chemicals over the past 30yrs has improved the thickness of the ozone layer.

Past the stratosphere you will go through the **mesosphere** that burns up most meteors before they impact earth. 50 miles from the surface you will enter the **ionosphere** and then **exosphere**, the farther from the surface the thinner (less dense) the atmosphere gasses get. The atmosphere ends around 6,000 miles from earth's surface, to compare the space station orbits the earth at a distance of 249 miles from earth.

The atmosphere is made up of a collection of different gasses. The most abundant gases are Nitrogen 78% living things use this to make proteins. The gas we breathe Oxygen 21% is used by most living things for respiration (breathing) and is necessary for combustion or burning. Argon is the next abundant gas at just under 1% this can often be found in light bulbs. Carbon Dioxide the gas we exhale and plants use to make oxygen only makes up 0.03% of the atmosphere, it is also important in preventing the escape of heat into outer space. Scientist are afraid that the burning of fossil fuels like oil and coal are adding more carbon dioxide to the atmosphere and causing more heat to be trapped resulting in global warming. The rest of the gasses make up less than 1% of the atmosphere some of them are helium, neon, xenon, krypton, and other chemical mixes. Another gas that can be found in the atmosphere is water vapor, which can range from 0% up to 4% water is needed for many life process however. Water vapor plays a major role in preventing heat from leaving the earth, think in the summer it is warmer on a night with clouds and cooler on a cloudless night.

Scientists continue to study and monitor the atmosphere to help protect it while it provides us with a place to live. If we enjoy life on earth the way it is, we need to do our part to help protect the air that makes up the atmosphere.

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1. The atmosphere is?

_____

2. What layer of the atmosphere can we find snow storms in? _____

3. What are the 3 main gasses found in the atmosphere, and in what percents?

_____

4. In what layer can the ozone layer be found? _____

5. Near the bottom of what layer do most commercial planes fly in? _____

6. Why is it colder on a summer night when there are no clouds in the sky?

_____

_____

7. List 4 things that the atmosphere does for humans to keep us alive?

_____

_____

_____

8. What holds the earth's atmosphere in place? _____

9. What layer of the earth provides protection from smaller meteors? _____

10. What are two gasses that trap heat in the earth's atmosphere?

_____

11. What are humans doing that scientist think can be speeding up global warming?

_____

12. What would happen to human life on earth if the ozone layer disappeared?

_____

_____

13. Write in the layers of the atmosphere, in order from least dense (a) to most dense (e)

a. _____

b. _____

c. _____

d. _____

e. _____

14. Why do you think the densest layer of the earth is found closest to the earth's surface?

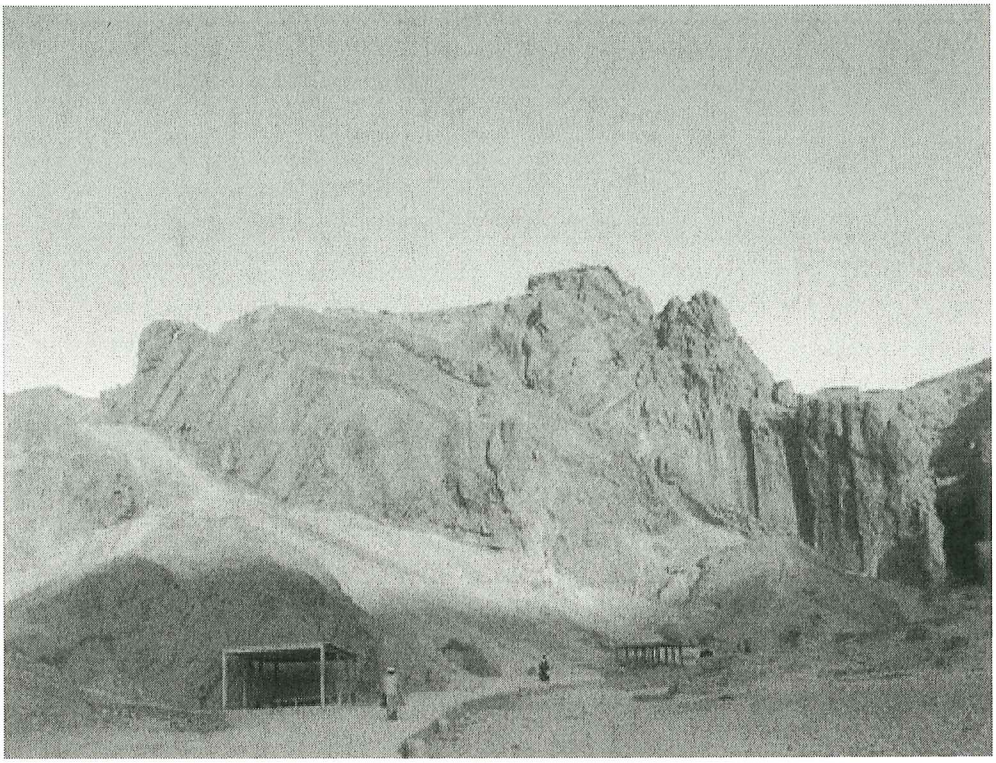
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Nefertari's Tomb

by Alizah Salario



Valley of the Queens in Egypt

Think about a story involving tomb raiders, a journey into the underworld, and a romance between a glamorous queen and a powerful king. This may sound like the latest Hollywood blockbuster, but it's a script pulled straight from the history books. The story begins with Ramesses the Great, who is known to have ruled Egypt from 1279 B.C. to 1213 B.C. Ramesses had many consorts, but his most beloved wife was Queen Nefertari. She was known for her beauty and for the many Egyptian monuments built in her honor. Nefertari had many nicknames including "beautiful face," "pretty with two feathers," and "appeasing the Gods." When Queen Nefertari died, Ramesses ordered the building of one of Egypt's most extraordinary tombs for her.

Nefertari's tomb is located in Egypt's Valley of the Queens, which hosts more than 70 lavishly decorated tombs belonging to queens, princesses, and other members of the nobility. Queen Nefertari's tomb is considered the most impressive of them all. It's known as the Sistine Chapel of ancient Egypt because of its beautiful decorations and detailed artwork. When it was discovered in 1904 by an Italian Egyptologist, Nefertari's tomb had long before been looted by tomb raiders. They had stolen nearly all of the precious treasures buried with the queen, including her sarcophagus and her mummy. Still, the tomb was an extremely important discovery. The magnificent paintings on the tomb walls are some of the most detailed and well-preserved in all of ancient Egypt. The stories these paintings tell about Queen Nefertari's journey into the underworld shed light on ancient Egyptian beliefs about death and the afterlife.

The ancient Egyptians developed elaborate burial rituals and ornate tombs because they believed in

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a life after death. These rituals were designed to help the deceased travel safely into the netherworld and hopefully find paradise in the world beyond. (This is one of the reasons grave robbing was considered such a heinous crime in ancient Egypt. Looters not only took material goods, but, it was believed, stole the deceased's chance at a peaceful afterlife.) Ancient Egyptians believed that when people died, they rode across a lake of fire on the boat of the god Ra. Once they crossed to the other side, they were faced with many challenges and tests on their journey into the underworld.

If you were to tour Nefertari's tomb today, you would first descend steps down into the rock where the tomb was built. Next, enter the antechamber, or vestibule, and notice the grand ceiling painted dark blue and flecked with golden five-pointed stars. On the east wall, notice a huge doorway. The god Osiris stands to the left and Anubis to the right of that opening. These gods are associated with mummification and the afterlife, and, in Egyptian mythology, play an important role in the journey of the deceased. Then cross the threshold into the next room, and examine the paintings of Nefertari being presented to the welcoming gods.

Walk around the room and take a moment to examine a splendid painting of the queen playing a game of senet against an invisible opponent. Perhaps her opponent is fate? (Senet is an ancient Egyptian board game, and sometimes senet game boards were put into graves to provide protection for the journey in the afterlife.) The queen wears a white gown of sheer linen, a gold bracelet, thick collar, and what are probably silver earrings. Her head is adorned with the vulture headdress of a queen. Other paintings in the room depict Nefertari giving special offerings to the gods.

Walk back to the antechamber, and then cross to the north wall, where you will see a stairway. Walk down the stairway, and you will find yourself in the large burial chamber. At one time, the queen's red granite sarcophagus lay in the middle of this chamber. Now carefully study the motifs and decorative pictograms about death and the afterlife on the walls and ceiling. Some of them illustrate ideas from *The Book of the Dead*, an ancient Egyptian funeral text that contained magic spells used to help dead people on their voyage to the underworld. Some of the scenes tell the story of Nefertari's meetings with gods and monsters, and in some cases they offer information about ceremonies concerning the afterlife. These images also provide information on the special roles of many major and minor gods that were important during Nefertari's time in Egypt's period called the New Kingdom. On the door of the burial chamber, notice an image of Nefertari emerging from the horizon, reborn as a sun disc.

Before leaving the burial chamber, look closely at the walls. They're decorated with poetry that Ramesses wrote for his wife. He is believed to have penned the line, "My love is unique-no one can rival her, for she is the most beautiful woman alive. Just by passing, she has stolen away my heart."

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Name: _____ **Date:** _____

1. Who was Nefertari?

A. a king who ruled Egypt from 1279 B.C. to 1213 B.C.

B. a queen whose tomb is located in Egypt's Valley of the Queens

C. a looter who stole goods from tombs in Egypt

D. an Egyptian god who was associated with the afterlife

2. What does the author describe in the second half of this text?

A. the journey of an Italian Egyptologist

B. a king's journey into the netherworld

C. the art inside Queen Nefertari's tomb

D. the plot of a Hollywood blockbuster

3. Ancient Egyptians wanted to help the deceased to travel safely into the underworld and find paradise in the afterlife. What evidence from the text best supports this conclusion?

A. "Ancient Egyptians believed that when people died, they rode across a lake of fire on the boat of the god Ra."

B. "On the east wall, notice a huge doorway. The god Osiris stands to the left and Anubis to the right of that opening."

C. "[S]ometimes senet game boards were put into graves to provide protection for the journey in the afterlife."

D. "The stories these paintings tell about Queen Nefertari's journey into the underworld shed light on ancient Egyptian beliefs."

4. How can ancient Egyptian beliefs about the afterlife best be described?

A. detailed and elaborate

B. simple and minimalistic

C. solemn and negative

D. celebratory and thankful

5. What is this passage mostly about?

A. a looting trend by tomb raiders impacting many Egyptian tombs

B. a tomb that gives insight into ancient Egyptian beliefs

C. the poetry a king wrote for his beloved wife after she died

D. the remarkable beauty and kindness of Queen Nefertari

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6. [Queen Nefertari's tomb] is known as the Sistine Chapel of ancient Egypt because of its beautiful decorations and detailed artwork. [. . .] The magnificent paintings on the tomb walls are some of the most detailed and well-preserved in all of ancient Egypt. The stories these paintings tell about Queen Nefertari's journey into the underworld shed light on ancient Egyptian beliefs about death and the afterlife.

The ancient Egyptians developed elaborate burial rituals and ornate tombs because they believed in a life after death.

Based on these sentences from the text, what does the word "ornate" mean?

A. simple and plain
B. heavily decorated
C. highly expensive
D. bright and colorful

7. Choose the answer that best completes the sentence.

The Valley of the Queens hosts more than 70 lavishly decorated tombs. _____, Queen Nefertari's tomb is considered the most impressive of them all.

A. However
B. Meanwhile
C. Therefore
D. Finally

8. Some scenes in Nefertari's tomb illustrate ideas from The Book of the Dead, an ancient Egyptian funeral text that contained magic spells. What was the purpose of these magic spells?

9. Why are the well-preserved paintings in Nefertari's tomb so important to people who want to learn about ancient Egyptians?

10. What does Nefertari's tomb tell us about ancient Egyptian beliefs regarding burials and the afterlife? Support your answer with at least one example of a painting or decoration in her tomb that illustrates these beliefs.

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Changes [The Run Series, #6]

by Lynne Stahl



Dennis and Jeremiah stared in horror from the truck. Anna had a hand firmly around Mac's throat.

"What is she *doing*?" Jeremiah squeaked in fearful confusion.

"Her wound," Dennis gasped, "she must be infected." But as he spoke, something strange happened. Anna's left hand reached up and gripped her right arm by the wrist, wrenching it away from Mac's neck. Mac retreated hastily, maneuvering so that a boulder stood between himself and Anna, but he seemed unhurt. What in the world was going on?

Dennis stomped on the gas, launching the truck forward. Hearing the noise, Mac and Anna looked up. Relief flooded Mac's face, but Anna just seemed scared. Dennis pulled up a short distance away and hopped out, strains of bluegrass still trickling from the now-functioning radio.

"Unbuckle yourself," Dennis told Jeremiah. He was reluctant to put the boy in harm's way, but they'd be safer together if they needed to fight - or flee - Anna. "Stay near the truck, but be ready for anything."

Jeremiah nodded bravely, making Dennis proud and a little sad - they'd all had to grow up quickly to survive this zombie plague. Only a few weeks ago, he, Mac, and the other workers had been sitting happily around the table in the Greersons' kitchen, listening to Petey Coltrain and playing poker with hardly a care in the world. And now - now one of his friends was trying to strangle another.

"Mac!" Dennis yelled, sprinting toward them. "Are you okay?" Maybe it was his imagination or the rising sun's reflection, but he thought Anna's eyes held a glint of red. She didn't look hostile, though, just shaken and confused.

"Great timing, Dennis," Mac said, keeping a wary eye on Anna. "We may have a slight problem." He

gestured toward Anna, whose frightened gaze was back on her hand.

"Anna, are you okay?" Dennis asked her. "What happened?"

"I think . . . " Anna's voice trembled. "I think I'm turning into one of *them*."

Dennis and Mac exchanged a glance. Neither needed to ask who "them" meant. They looked at her bandaged right shin and noticed angry purple streaks creeping upward from it.

"It started with my leg," she continued. "It was tingling all night, and then it began pulling me."

"Your leg pulled you?" Dennis asked, his stomach tight with fear.

Anna nodded. "My arm started feeling funny, too. Almost like it was asleep, but also like something else was controlling it." Her right arm twitched violently when she spoke, as if to prove her point.

Mac felt desperate. It seemed evident that Anna was infected and slowly turning into a zombie - one who wished them harm. But she was also still *Anna*, and Anna was their friend. How could they help her? How much time did they have? Dennis's troubled face suggested that he shared these conflicted thoughts.

"Don't worry," Jeremiah piped up suddenly. "We'll find a way to help you." The others looked surprised but appreciative of his clear determination.

"Thank you," she replied, her eyes now clear. "I promise I'll try not to . . . you know." She regarded her rogue arm fearfully.

"Let's start driving," Dennis said. "If we can find more survivors, they might know what to do. We've made a lot of noise - it's probably not safe to stay here any longer."

They started toward the truck. As Mac passed Anna, her right hand leapt out and grabbed his shirt. He yelped, yanking himself free. "I'm sorry!" Anna said, horrified. She grasped her right wrist with her left arm and stared down at her right leg, which was kicking out toward Mac.

Dennis gripped her gently by the shoulders. "Um, not to be rude," he said, "but maybe you should ride in back, Anna."

She nodded mutely and climbed into the truck bed. Jeremiah arranged the tarps into a makeshift seat. Mac hated isolating her, but he worried about her rebellious limbs interfering with Dennis's driving. Jeremiah squeezed her hand before hopping into the truck.

"Everyone buckled?" Dennis asked after Mac hopped in. "This could get bumpy." He threw the truck into gear, and they rumbled back toward the highway. He fought the impulse to speed away, not wanting to jostle Anna.

Dennis suspected Mac was casting his brain around for solutions as wildly as Dennis was - and without success. Uncomfortable in the silence, Jeremiah turned the radio back up, and Petey Coltrain's lively bluegrass rushed in.

Mac's head snapped up. "Since when is the radio working?"

Dennis shrugged. He'd forgotten about it. "I'm not sure. I turned it on out of habit when we left this morning, and bluegrass was playing. Why-"

"We have to go there," Mac interrupted. "Don't you see?" When Dennis looked blankly, he continued excitedly. "If Coltrain's playing music, that means he's *survived*. And if he's taking the time to spin bluegrass, his life must not be in danger. Right? Maybe he can help!"

Dennis wasn't sure Petey Coltrain could help them - or Anna - but felt relieved to have a clear destination. Mac was already poring over the maps that had resided in the glove compartment. "Okay, co-pilot," Dennis said, "just tell me which way-" but his words were drowned out by a violent thump on the rear windshield.

The boys' heads whipped around, though Dennis quickly turned his eyes back to the road. "What was *that*?"

Mac looked sick. "It's Anna," he replied, "Well - Anna's leg."

Another thump shook the rear window, so forceful that Dennis felt the impact through his headrest.

Anna had twisted herself around in the truck bed and was pounding the thick heel of her right hiking boot into the glass. Or rather, Mac suspected, Anna had lost control, and the zombie was taking over.

"We're going the right way!" Mac jabbed triumphantly at the map. "I recognize this stretch of highway from when we left the Greersons' ranch. The radio station's only 30 miles ahead."

Thirty miles didn't sound like much, but Dennis felt as though he was barely inching along. He was tempted to slam the gas to dislodge zombie Anna, but he knew their friend was still inside. He couldn't do it. As Dennis drove, the heel kept coming down, its rhythm an ominous contrast to the bright bluegrass still playing. The glass was strong, but how long could it hold?

The answer came quickly. Dennis gritted his teeth at the unmistakable noise of shattering glass. Cold air whooshed against his neck as the rear windshield gave way. Anna's leg, now a hideous purple, kicked through the remaining glass, and her boot's motion continued directly into the back of Dennis's skull. Dennis felt his head zoom toward the steering wheel, and then everything went black.

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Ed.: *The tale ends with Part 7, "End of the Road."*

Name: _____ **Date:** _____

1. What is Anna doing at the beginning of the text?

A. trying to kick Mac with her leg

B. quietly sitting in the back of the truck

C. grabbing Mac's throat firmly with her hand

D. listening to bluegrass music

2. What is causing Anna to behave strangely and violently?

A. She secretly hates Mac, Dennis, and Jeremiah.

B. Her wound has been infected and she is turning into a zombie.

C. She is trying to escape from the three boys.

D. Her wound has been healed and she is becoming a human again.

3. Please read these sentences from the text:

"As Mac passed Anna, her right hand leapt out and grabbed his shirt. He yelped, yanking himself free. "I'm sorry!" Anna said, horrified. She grasped her right wrist with her left arm and stared down at her right leg, which was kicking out toward Mac."

Based on this evidence, what can you conclude about Anna?

A. Anna has very strong willpower, and can stop herself from getting worse.

B. Anna is trying to keep control, but is having a lot of trouble.

C. Anna doesn't want Mac to join the others as they continue driving.

D. Mac is stronger than Anna, so he can handle it when Anna gets violent.

4. How can Mac's and Dennis's overall moods best be described in this text?

A. hopeful, determined, and calm

B. confused, unhappy, and angry

C. annoyed, disappointed, and tired

D. scared, worried, and desperate

5. What is the main idea of this text?

A. A group of friends tries to figure out what to do and where to go as one of them seems to be turning into a zombie.

B. A group of friends gets attacked by a swarm of people who have been infected with a zombie-making plague.

C. A group of friends sets out in search of a man who plays their favorite bluegrass music on the radio.

D. A group of friends tries to find a way to stop a plague that seems to be taking them all over and turning them into zombies.

6. Throughout the story, the author describes Anna's leg and arm as "rogue" or "rebellious". Why might the author have chosen these words to describe Anna's limbs?

A. to emphasize that Anna's zombie limbs were not actually being controlled by the real Anna

B. to show that Anna was making the decision to strangle, kick at, and harm the boys

C. to suggest that Anna was becoming more and more of a traitor in the eyes of her friends

D. to prove that all it would take for Anna to regain control of her zombie limbs is strong willpower

7. Please choose the answer that best completes the sentence below.

Dennis and Mac feel conflicted because ___ Anna is becoming a zombie, she is still their friend.

A. however

B. although

C. because

D. meanwhile

8. Why do the friends decide to drive to the radio station?

9. How does the decision to drive to the radio station affect Dennis and Mac's feelings? Support your answer with evidence from the text.

10. At the end of the story, before Anna's leg breaks through the windshield, it thumps against the glass over and over. What effect does this have on the mood of the story? Support your answer with details from the text.