MCMS
7th Grade
NTI Packet
Day 20

MCMS

7th Grade Math

NTI Day #20

Name _____ Date _____ Class _____

LESSON 12-3

Puzzles, Twisters & Teasers

All Aboard!

Decide whether or not each solution is correct. Circle the letter above your answer. Then use the letters to solve the riddle.

1. $6m = 4m + 12$ $\quad m = 6$

W	**A**
correct	incorrect

2. $5n = 4n + 32$ $\quad n = 4$

M	**I**
correct	incorrect

3. $4y = 2y + 40$ $\quad y = 10$

V	**D**
correct	incorrect

4. $5n = 3n + 26$ $\quad n = 13$

E	**Q**
correct	incorrect

5. $8 + 6a = -2a + 24$ $\quad a = 3$

J	**O**
correct	incorrect

6. $19 + 7n = -2n + 37$ $\quad n = 2$

N	**W**
correct	incorrect

7. $12h = 9h + 84$ $\quad h = 12$

P	**T**
correct	incorrect

8. $\frac{5}{9}x + 83 = \frac{4}{9}x + 92$ $\quad x = 81$

W	**C**
correct	incorrect

9. $9t = 4t + 120$ $\quad t = 7$

G	**A**
correct	incorrect

10. $4.19d = 74.8 + 1.99d$ $\quad d = 34$

I	**B**
correct	incorrect



How do you define a "twip"?

A ____ ____ ____ ____ you take ____ ____ a ____ ____ ____ ____ n

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7th Science
NTI 20 (2 pages)

Scientist _____ Date _____ Period _____

Heat Transfer

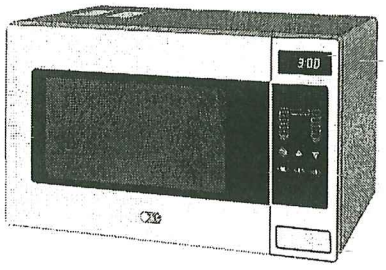
Using words from the word boxes below, complete the paragraph about heat transfer.

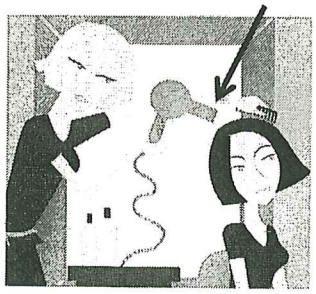
faster	hot	less	solid	fluid
conduction	more	convection	energy	emit
warmer	matter	transfer	absorb	temperature
radiation	contact	cold	vibrate	waves

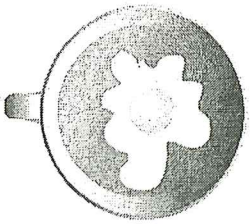
All _____ has heat. Heat is a form of _____ caused by particles in an object that _____. The _____ the particles of an object vibrate, the _____ the object will be. Because particles of an object are always moving, heat _____ is always happening. Heat always flows in the same direction: from _____ to _____. Heat transfer will stop once two objects reach the same _____. This is known as equilibrium.

There are three key ways that heat transfers. With _____ objects, heat transfers when the objects come into direct _____ with other things. This is known as _____. Liquids and gases are different. Because these two states of matter flow, or are _____, heat transfer happens when warmer, _____ dense particles rise and cooler, _____ dense particles sink. This ongoing process is known as a _____ current. Heat can also be transferred through space (distance) in the form of _____. This process is known as _____. All objects give off, or _____, some heat. All objects also take in, or _____, heat.

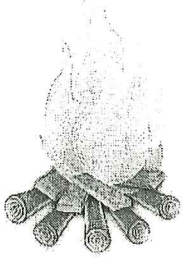
Identify the method of heat transfer that takes place in each illustration. Write the method of heat transfer underneath the picture.

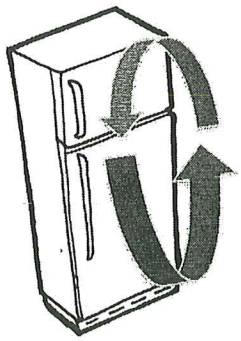
1. 

2. 

3. 

4. 

5. 

6. 

Curtis Hall, The Science Matters, 2015

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In the boxes below, draw an example of each type of heat transfer. Explain how heat is being transferred in your example.

Conduction	Convection	Radiation
Explanation: _____	Explanation: _____	Explanation: _____

In each of the following situations, identify the method of heat transfer taking place. Write conduction, convection, or radiation on the line next to the statements. Choose the <u>best</u> answer.

1. You are stirring a bowl of hot soup with a metal spoon. The spoon starts to feel warmer because of _____.
2. You buy a lava lamp from the store. As the lamp heats up, blobs of liquid rise to the top then sink back down to the bottom. This process continues because of _____.
3. You are doing your homework at a desk that is underneath a lamp. You start to feel hotter because of _____ from the lamp.
4. Your best friend has a bunk bed. You move from the bottom bunk to the top bunk and notice that the air is warmer. The warm air rises because of _____.
5. You are in science class and want to see if the hot plates were used recently. You place your hand over the hot plate. Without touching the hot plate, your hand feels warmer. Heat is transferred to your hand by _____.
6. You are roasting marshmallows at a campfire. The metal skewer (stick) that you're cooking your marshmallow on burns your hand because of _____.

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Centuries of Peace

by ReadWorks



Given the regular outbreaks of religious and political violence in the Middle East, it's easy to think of Muslims, Jews, and Christians as natural antagonists. This wasn't always the case, however. For hundreds of years, Muslims, Jews, and Christians lived in peace on the Iberian Peninsula, in what is now Spain. They farmed side-by-side, governed together, and even shared their most important intellectual and religious texts. This collaboration led to the founding of the first modern universities in the West.

But this peaceful collaboration is not what many remember most about the Muslim empire in Spain. What's most commonly known about the Muslim empire in Spain is its savagely violent beginning and end. After watching for centuries as the Visigoth empire collapsed into corruption and civil war, Muslims in Northern Africa began planning a massive invasion of the Iberian Peninsula. Under General Tariq ibn Ziyad, an army sailed nine miles from Africa to the Rock of Gibraltar (derived from the Arabic "Tariq's Mountain") in 711. By 718, Muslims controlled all of today's Spain and Portugal and part of southern France. This territory was called al-Andalus. Almost 800 years later, the last Muslim leaders were expelled from Spain during a brutal 11-year military campaign that ended on January 2,

reserved.

1492, when King Mohammad XII surrendered in Granada.

Between these violent bookends, however, thrived a rich and multicultural culture called the Convivencia, or coexistence. While there were occasional outbreaks of violence and repression by Muslim authorities directed against people of other faiths, Christians and Jews were officially labeled "dhimmis," or protected peoples under Islamic law. A small number of Jews and Christians rose to powerful positions in the government.

People from all three faiths also joined together to share ancient texts that had been preserved by their respective religious teachers. In Toledo and in the empire's capital of Cordoba, monks and scholars gathered from across Europe and the Muslim world to translate and debate important texts. Perhaps the most important of these scholars was Averroes, who was known in Arabic as Ibn Rushd. Averroes, a judge and scholar, delivered the forgotten wisdom of Aristotle to the rest of the world. He helped rescue ancient Greek philosophy from oblivion, enabling the Muslim empire's golden age to provide the intellectual backbone later used to build modern Western civilization.

Born in 1126 to a family of prominent civic leaders, Averroes was considered a polymath, becoming a master in Greek and Islamic philosophy, theology, mathematics, and science. He started translating Aristotle from Greek into Arabic after the ruler of the Iberian caliphate asked him to create a version of the text that was clearer and easier to understand than previous translations. Averroes went on to translate most of the known works by Aristotle plus *The Republic* by Plato and also published many short commentaries on each work.

His work came at an important time. By the 12th century, only a handful of Europeans could still read the works of Aristotle in their original Greek. Few copies of the original survived because they had been written on fragile papyrus, and most versions copied onto more durable and expensive parchment were owned by Islamic authorities. After circulating through the scholastic society of Cordoba, Aristotle's works were copied and sent across Europe, sparking a resurgence of interest in his philosophy in the West that continues today.

While all this seems very remote, the reasons behind Averroes's work are just as important today. His best-known original work, "The Incoherence of the Incoherence," was a defense of the rational mind over religious belief as the root of wisdom and knowledge. Aimed at Islamic leaders who were trying to enact a stricter version of religious law across the empire, Averroes took a risky position, arguing that humans should be the ultimate deciders of law and justice, not God. Five hundred years before writers such as Thomas Hobbs navigated a similar path, Averroes's positions have caused many to call him the "founding father of secular thought in Western Europe." Many of his works were kept at the personal library of the local caliph, or emperor, who was estimated to have collected around 400,000 books, making it one of the largest libraries in the world at the time.

While Averroes argued for greater plurality of world views, the culture of the Iberian peninsula promoted religious equality-or at least some modicum of tolerance-on a day-to-day basis. Jews emigrated from the Middle East and Northern Africa to Toledo and other major cities on the Iberian peninsula, creating some of the most stable and prosperous Jewish communities in the world at the time. It was here that a Hebrew Renaissance flourished, resulting in some of the most important works of Hebrew poetry.

Perhaps the most surprising collaboration between religions during the al-Andalus empire happened inside the mosques, which were shared between Muslims and Christians. This was most apparent at

the Mosque-Cathedral of Cordoba. Founded in the year 600 by the Visigoths as a Catholic church, it was divided by Muslim leaders into Muslim and Christian sections after the Muslim conquest. As more Muslims immigrated to Cordoba and their ranks overwhelmed the building, the emir (ruler of al-Andalus) purchased the other half from the Christians and allowed the Catholics to rebuild churches that had been destroyed during the invasion. Thus began a two-century construction project to enlarge the mosque, which came to include some of the tallest and most ornate indoor structures in all of medieval Europe. The mosque was rechristened as Cordoba's cathedral when Christians re-took the city in 1236. Three hundred years later, local church leaders proposed to destroy the huge mosque and build a church in its place. But the townspeople were so opposed to the plan they won a rare intercession from the Holy Roman Emperor, second in the Vatican hierarchy only to the Pope, who agreed the mosque should be saved. Today the entire sprawling complex is protected by the United Nations as a World Heritage Site.

Coexistence between Jews, Christians, and Muslims during Islamic control of Spain was not perfect. Jews and Christians were never fully equal to Muslims under Islamic law, and their treatment varied based on changing political and religious decisions of Muslim leaders. But the centuries of Muslim rule were characterized by greater tolerance than anything found at the time in Europe. And thanks to the relative tolerance of the Muslim al-Andalus empire, Western Society rediscovered some of the philosophy and art that would become its foundation.

Name: _____ **Date:** _____

1. According to the passage, where did Muslims, Jews, and Christians live in peace together for hundreds of years?

A. Northern Africa

B. the Middle East

C. the United States

D. the Iberian Peninsula

2. Averroes translated most of the known works by Aristotle from Greek into Arabic. What effect did Averroes's translations have?

A. Aristotle's translated works circulated throughout Europe, sparking a resurgence of interest in Aristotle's philosophy.

B. Aristotle's translated works circulated throughout Europe, sparking widespread criticism of Aristotle's philosophy in the Muslim empire.

C. The Iberian caliphate asked Averroes to create versions of Greek texts that were clearer and easier to understand than previous translations.

D. Averroes formed a defense of the rational mind over religious belief as the root of wisdom and knowledge.

3. The Mosque-Cathedral of Cordoba is a symbol of peaceful religious coexistence. What evidence from the passage best supports this conclusion?

A. The Mosque-Cathedral of Cordoba included some of the tallest and most ornate indoor structures in all of medieval Europe.

B. The Mosque-Cathedral of Cordoba was divided by Muslim leaders into Muslim and Christian sections after the Muslim conquest.

C. The Mosque-Cathedral of Cordoba was founded in the year 600 by the Visigoths as a Catholic church.

D. The emir purchased the other half of the Mosque-Cathedral of Cordoba from the Christians and allowed the Catholics to rebuild churches that had been destroyed during the invasion.

4. The word "secular" is used to describe something that is not based on or connected to religion. Why is Averroes considered the "founding father of secular thought"?

A. He argued for the greater plurality of world views.

B. Many of his works were kept at the personal library of the local caliph, or emperor, who was estimated to have collected around 400,000 books.

C. He defended the rational mind over religious belief as the root of wisdom and knowledge.

D. He took a risky position during a time when Islamic leaders were trying to enact a stricter version of religious law across the empire.

5. What is this passage mainly about?

A. the treatment of people of different faiths during the Muslim empire in Spain

B. the culture of the al-Andalus empire in Spain

C. the life and work of Averroes

D. the resurgence of Greek philosophy during the Muslim empire in Spain

6. Read the following sentence: "Given the regular outbreaks of religious and political violence in the Middle East, it's easy to think of Muslims, Jews, and Christians as natural **antagonists**. This wasn't always the case, however. For hundreds of years, Muslims, Jews, and Christians lived in peace on the Iberian Peninsula, in what is now Spain."

As used in this passage, what does the world "**antagonist**" most nearly mean?

A. enemy

B. friend

C. supporter

D. neighbor

7. Choose the answer below that best completes the sentence.

The Mosque-Cathedral of Cordoba eventually had sections for Muslims and Christians, _____ it was originally built as a Catholic Church.

A. thus

B. also

C. but

D. like

8. What is the Convivencia?

9. Describe an example of people from different religions on the Iberian Peninsula coexisting or collaborating peacefully.

10. How did Averroes support the peaceful collaboration between Muslims, Jews, and Christians during the Muslim empire in Spain? Use information from the passage to support your answer.

The Power of the Wind

by ReadWorks



A soft, rumbling hum vibrated in Kyle's ears as he approached the farm. His mom walked in front of him, taking long, purposeful strides. Next to him, a group of curious visitors trotted in tow, listening to Kyle's mom spout off facts. She was giving a tour of a wind turbine farm located in northern California in order to educate the public on the benefits of using wind energy. Kyle decided to tag along and learn something for himself. He knew only the basics about his mom's profession, but was becoming more and more interested in alternative energy after living in Los Angeles for so long and experiencing the pollution and smog in the air.

"So there are three major types of wind power: utility-scale wind, distributed wind, and offshore wind," his mom yelled to the group in an attempt to be heard over the hum of the turbines. "Here, we use utility-scale wind, in which turbines larger than 100 kilowatts generate electricity that is typically distributed by power system operators." The visitors all nodded their heads, some taking notes. "When wind blows past the turbine, it triggers the movement of the blades, which starts to spin a shaft inside of the turbine, which then causes an attached generator to produce electricity," she explained. She had studied both environmental science and engineering in college, so she understood how these turbines worked and the positive impact they had on the environment. She had been working at an environmental non-profit organization in Los Angeles before moving her family a few hours upstate in order to promote the wind turbine farm and its energy efficiency.

As Kyle's mom continued to rattle off information about the turbines, Kyle's mind drifted to his life in LA. He wasn't too excited to leave his friends, but he couldn't wait to move to "the country"-or at least that's what everyone at school called it. They knew that he and his parents were moving to a farm, but not many knew exactly what a wind turbine farm was. All they could picture were those gigantic fan-looking machines that slowly rotated in the breeze. They were right to an extent, since that was exactly what Kyle and the group were about to see. But since several families had moved closer to the farm to work with wind energy, there were plenty of kids whom Kyle could befriend. Their parents also worked with the turbines.

Finally, the group reached their destination. "Well, this is it!" said Kyle's mom. At that point, the soft hum had increased to the sound of a loud lawnmower, and the visitors had to yell to each other to be

heard. Everyone craned their necks back to look toward the top of the large turbines, each with three blades that slowly rotated with the wind. Kyle always imagined them moving faster, since they had to generate electricity, but his mom assured everyone that this was enough speed to produce adequate energy for the area. "In fact, California has the most utility-scale wind turbines in the United States, with more than 12,000 turbines," she told the group. Everyone stood in silence for a while, admiring the tall, white machines rotating against the clear blue sky. Kyle breathed in the fresh air and closed his eyes, feeling perfectly content.

On the way back to the farm's main office, Kyle's mom told the group about her job and responsibilities. Since she specialized in engineering, she was particularly interested in the design of the wind turbine blades. She was heavily involved in research to design a blade that could more efficiently capture energy from the wind. After building a few prototypes, she and her team would test the blade in an air tunnel and measure the amount of energy it could produce. "Then we'll make sure we can manufacture the most efficient model on a larger scale, and hopefully distribute them to farms across the country," she explained.

Kyle knew plenty about this part of the job, mainly because his mom often missed dinners or left extremely early for work when she was in certain stages of designing. She would then come home and excitedly share her work with Kyle and his dad, who always listened patiently, even when they could hardly understand anything she was saying. That's why they decided to move to the country-her passion for her work. When she was offered a job at the wind turbine farm, they packed up the car and drove north. Kyle remembered feeling the air change. As they drove further and further away from the city, he kept rolling his window down bit by bit.

After his friends, he missed LA food the most, and being able to walk out of his house at any hour of the day to find at least a food truck open for business. Out near the farm, there were only a few restaurants that offered meals that suited Kyle's palate. But he could hardly complain when he spent the whole day outside, wandering among the vast fields and hiking new trails. Each day he returned home exhausted from the fresh air and the relentless sun. Since he was still on his summer break, the only opportunity he had to meet new friends was through his mom's work. With school, he knew he would meet more. And maybe his old friends from the city would come visit, and see the beauty of the countryside-fields, wind turbines, fresh air, and all.

Name: _____ **Date:** _____

1. Where does Kyle's mom work?

2. How does Kyle's mom feel about her work?

3. Read the following sentences.

"But he could hardly complain when he spent the whole day outside, wandering among the vast fields and hiking new trails. Each day he returned home exhausted from the fresh air and the relentless sun. Since he was still on his summer break, the only opportunity he had to meet new friends was through his mom's work."

Based on this information, how does Kyle most likely feel about his new life in northern California?

4. Based on the text, why is Kyle's mom interested in wind turbines?

5. What is this story mostly about?

6. Read the sentences and answer the question.

"'Here, we use utility-scale wind, in which turbines larger than 100 kilowatts generate electricity that is typically distributed by power system operators.' The visitors all nodded their heads, some taking notes. 'When wind blows past the turbine, it triggers the movement of the blades, which starts to spin a shaft inside of the turbine. This causes an attached generator to produce electricity,' she explained."

What does the word "generate" most nearly mean as used in the text?

7. What word or phrase best completes the sentence?

Kyle's mom was offered a job at the wind turbine farm. _____, his family moved to northern California.

8. Why is Kyle joining his mom on the tour she is giving of a wind turbine farm?

9. Why did Kyle know plenty about the work his mom did to design more efficient wind turbine blades?

10. Explain how Kyle's mom's career has impacted him. Support your answer using evidence from the text.