RIVER CITY SCIENCE ACADEMY
MANDARIN

Dear Incoming 6th Grade Students:

We are looking forward to our upcoming year together. We have prepared some activities for you to work on over the summer to keep your mind active for the next school year. Please see the attached activities prepared by your new teachers. Be prepared to turn in each assignment to each subject's teacher. Have a great summer!

- RCSA Mandarin 6th Grade Team

10911 Old St. Augustine Rd. Jacksonville, FL 32257 Tel: (904) 855-8010 Email: mandarin-info@rivercityscience.org

Reading/Language Arts Assignment

From the list of choices, please select ONE fiction book and ONE nonfiction book to read. Then respond to the following questions and bring your responses to school the first day.

TITLE	AUTHOR
Fiction	
The Lightning Thief	*Rick Riordan*
Wonder	*R.J. Palacio*
Save Me a Seat	*S. Weeks/G. Varadarajan*
Escape from Mr. Lemoncello's Library	*Chris Grabenstein*
Harry Potter and the Sorcerer's Stone	*J.K. Rowling*
Game Changers	*Mike Lupica*
Among the Hidden	*Margaret Peterson Haddix*
Falling Over Sideways	*Jordan Sonnenblick*
The Cavendish Home for Boys and Girls	*Claire Legrand*
Bud, Not Buddy	*Christopher Paul Curtis*
Nonfiction	
Scientists in the Field	*Pamela S. Turner*
The Great White Shark Scientist	*Sy Montgomery*
Lincoln's Grave Robbers	*Steve Sheinkin*
Claudette Colvin: Towards Justice	*Phillip M. Hoose*
Saved By the Boats	*Julie Gassman*
Women Who Changed the World	*Laurie Calkhovem*
The Tarantula Scientist	*Sy Montgomery*
Knots in My Yo-Yo String	*Jerry Spinelli*
Hazardous Tales: Alamo All-Stars	*Nathan Hale*
Alexander the Great: Master of the Ancient World	*Doug Wilheim*

Fiction Book Questions

1. Were there any characters similar to you in the book? How would the story be different if you were the main character?

2. What two events in the story stood out to you as memorable? Why?

3. What was one major theme you noticed in the book?

Nonfiction Book Questions

1. What is something new you learned from reading this book?

2. Did any new information surprise you? Explain how this information added to your knowledge of the subject.

3. Did anything change or challenge what you already knew? Please explain.

Math Assignment

Complete each attached worksheet and turn in on the first day of school.
Make sure to show your work.

K5 Learning

Order of operations

Grade 5 PEMDAS Worksheet

The order of operations:
1. *Parentheses ()*
2. *Exponents 5^2*
3. *Multiplication × or Division ÷*
4. *Addition + or Subtraction –*

Solve the following using PEMDAS

1. $3 \times 9 + 7$

2. $12 + 36 \div 4$

3. $9 \div 3 + 4 \times 6$

4. $2 \times 11 - 12 \div 2$

5. $8 \times 18 \div 4 + 15$

6. $(67 - 18) \div 7 \times 3$

7. $5^2 - 8$

8. $2^3 \times 3^2$

9. $4^2 \times (8 - 3)$

10. $(7 \times 8 - 4) \div (6 - 2)$

Long division by single digit (no remainder)

Grade 5 Division Worksheet

Find the quotient.

1. $2\overline{)4{,}050}$

2. $9\overline{)6{,}633}$

3. $2\overline{)2{,}780}$

Multiply in columns - 2 digit by 3 digit

Grade 5 Multiplication Worksheet

Find the product.

1. 257×50

2. 642×50

3. 517×82

4. 690×52

5. 942×17

6. 511×98

Multiplying fractions (denominators 2-12)

Grade 5 Fractions Worksheet

Find the product.

1. $\frac{6}{8} \times \frac{3}{12} =$ _____

2. $\frac{1}{2} \times \frac{4}{5} =$ _____

3. $\frac{2}{4} \times \frac{7}{8} =$ _____

4. $\frac{2}{7} \times \frac{7}{9} =$ _____

5. $\frac{4}{10} \times \frac{1}{6} =$ _____

6. $\frac{2}{5} \times \frac{1}{4} =$ _____

Adding decimals (1 decimal digit)

Grade 5 Decimals Worksheet

Find the sum.

1. 9.6 + 9.7 = _____

2. 2.7 + 4.8 = _____

3. 7.8 + 2.6 = _____

4. 6.1 + 1.1 = _____

5. 4.0 + 4.8 = _____

6. 8.4 + 9.5 = _____

7. 3.9 + 1.6 = _____

8. 8.4 + 3.6 = _____

Adding unlike fractions

Grade 5 Fractions Worksheet

Find the sum.

1. $\frac{1}{2} + \frac{2}{3} =$ _____

2. $\frac{8}{12} + \frac{8}{11} =$ _____

3. $\frac{2}{7} + \frac{6}{10} =$ _____

4. $\frac{1}{6} + \frac{6}{11} =$ _____

5. $\frac{5}{9} + \frac{1}{2} =$ _____

6. $\frac{9}{12} + \frac{2}{12} =$ _____

7. $\frac{2}{7} + \frac{1}{4} =$ _____

8. $\frac{1}{4} + \frac{6}{8} =$ _____

Subtracting unlike fractions

Grade 5 Fractions Worksheet

Find the difference.

1. $\frac{5}{7} - \frac{2}{3} =$ _____

2. $\frac{2}{3} - \frac{3}{8} =$ _____

3. $\frac{6}{7} - \frac{2}{6} =$ _____

4. $\frac{4}{6} - \frac{4}{8} =$ _____

Convert improper fractions to mixed numbers

Grade 5 Fractions Worksheet

Convert.

1. $\frac{113}{12}$ = _____
2. $\frac{19}{2}$ = _____
3. $\frac{36}{10}$ = _____
4. $\frac{75}{12}$ = _____
5. $\frac{50}{8}$ = _____
6. $\frac{52}{10}$ = _____
7. $\frac{13}{3}$ = _____
8. $\frac{39}{4}$ = _____
9. $\frac{68}{10}$ = _____

Convert mixed numbers to improper fractions

Grade 5 Fractions Worksheet

Convert.

1. $7\frac{3}{5}$ = _____
2. $6\frac{5}{8}$ = _____
3. $9\frac{2}{10}$ = _____
4. $2\frac{2}{4}$ = _____
5. $6\frac{1}{9}$ = _____
6. $5\frac{5}{7}$ = _____
7. $3\frac{1}{8}$ = _____
8. $3\frac{3}{12}$ = _____
9. $6\frac{1}{11}$ = _____

World History (Social Studies) Assignment

There are **two parts** to the World History Summer Assignment. Part 1 is the map of the world that asks you to locate and learn the countries, bodies of water, and areas of importance. Part 2 is an essay, of your choosing, from a list of topics. Each part of the assignment is outlined below.

World History Assignment Part 1- The Map

Directions- For this section you have been provided with a blank map of the world. You may use the internet, books, or other resources to find the countries, continents, bodies of water, and empires that are listed below. You should fill out this map in its entirety. Color and label the empires. Make sure to create a key as to which empire is which color. Above all, label your map neatly.

Continents: Label all but Antarctica (which isn't pictured)

Oceans/Bodies of Water:

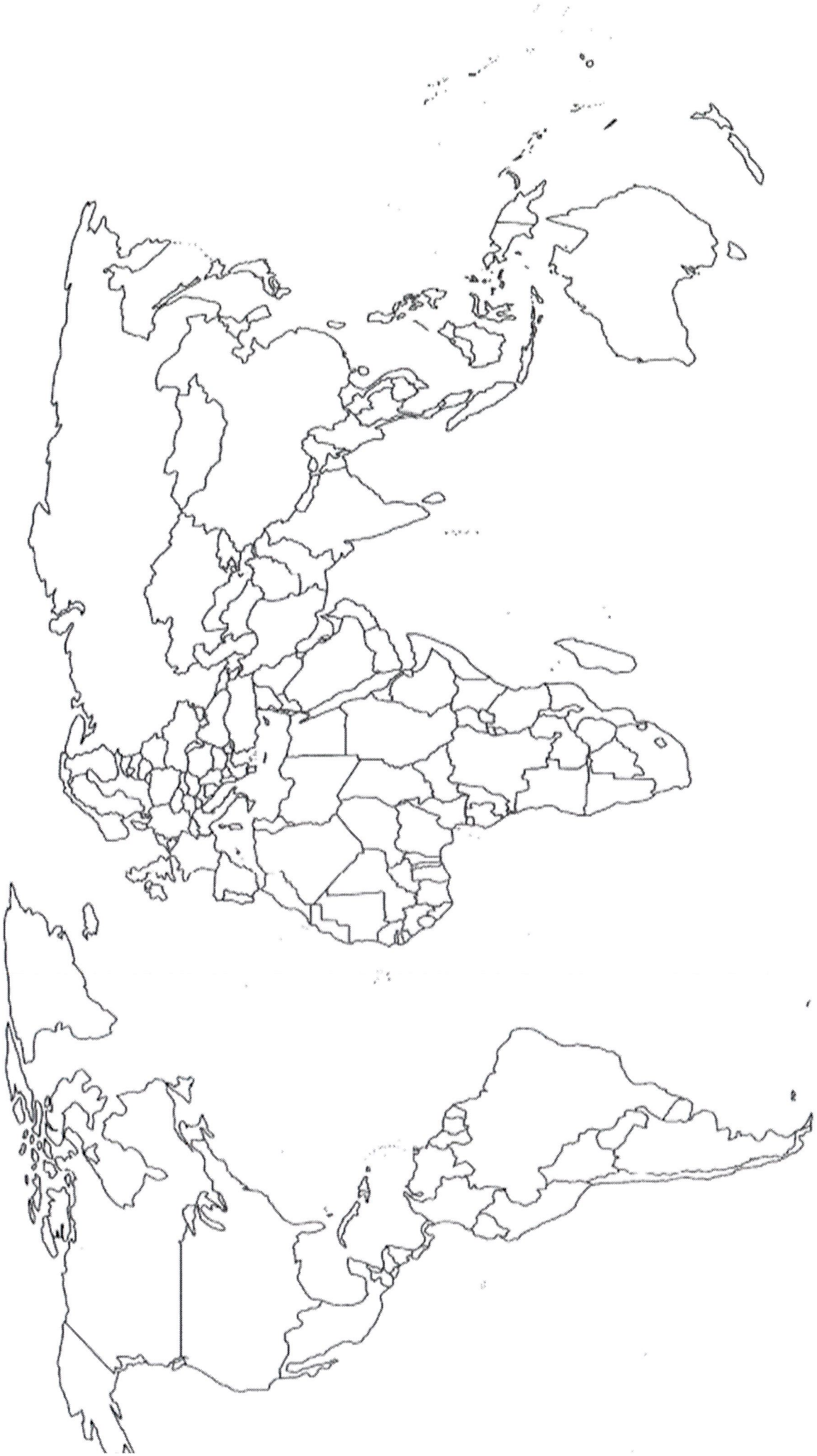
- Aegean Sea
- Arctic Ocean
- Atlantic Ocean
- Baltic Sea
- Bay of Bengal
- Black Sea
- Caspian Sea
- Great Lakes
- Gulf of Mexico
- Indian Ocean
- Lake Victoria
- Mediterranean Sea
- Pacific Ocean
- Persian Gulf
- Red Sea
- South China Seas
- Tigris and Euphrates Rivers
- Yellow Sea/East China Sea

Empires:

- Roman Empire
- Greek Empire
- Egyptian Empire
- Shang Empire
- Persian Empire
- Sumer/Fertile Crescent

Countries:

- Afghanistan
- Argentina
- Australia
- Austria
- Brazil
- Canada
- Chile
- China
- Egypt
- England
- France
- Germany
- Greece
- India
- Iran
- Iraq
- Ireland
- Israel
- Italy
- Japan
- Mexico
- Mongolia
- North Korea
- Norway
- Pakistan
- Peru
- Poland
- Portugal
- Russia
- Saudi Arabia
- South Africa
- South Korea
- Spain
- Syria
- Taiwan
- Turkey
- United States of America



World History Assignment Part 2- Essay

Below is a list of topics that we will learn about in World History. Choose a topic to research using Ducksters.com, History.com, or other educational site and write a 3-5 paragraph essay discussing how the culture evolved and changed during ancient times. Discuss the way people lived, what they ate, their religion, and any other important information you find about the topic. Become an expert, so you can share what you know as we learn about each topic.

1. Early Humans
2. Mesopotamia
3. Egypt
4. India
5. China
6. Hebrews
7. Greece
8. Rome
9. Islam
10. Africa
11. Japan
12. Early Americas

6th Grade Science Summer Packet

This science summer packet is designed to give you an insight as to how we

will be using our scientific skills to analyze information and make

conclusions based on pure scientific evidences.

Instructions:

Read each section of the packet carefully and answer every question.

Please ensure that your name is written on the packet and once you show up to class, you will write the period of science in the appropriate area of this front page.

Additionally, the pages should be stapled very neatly and placed in a folder. You will be expected to have this complete and turned in on the

very first or second day of school. I look forward to working with you all and I anticipate a very productive and exciting year. Enjoy your summer break.

Science: Developing a Classification System

The table below lists characteristics of different dog breeds. Use these characteristics to develop a classification system. The questions that follow will help you develop your system.

Characteristics of Dogs

Breed	Ears	Coat	Tail	Head Shape	Size
Beagle	long	short-haired	long	round	small
Wire fox terrier	short	wire-haired	shortened	long	small
Chow chow	erect	long-haired	curly	round	medium
Irish setter	long	long-haired	feathered	long	medium
Newfoundland	short	long-haired	feathered	square	large
Boston terrier	erect	short-haired	shortened	square	small
Pug	short	short-haired	curly	square	small
Deerhound	short	wire-haired	long	long	large

Write your answers to the following questions on a separate sheet of paper.

1. What characteristic did you use first to divide the breeds into groups? Why did you choose that characteristic?

2. What characteristic did you use to make a second division within the groups?

3. Continue dividing the breeds into groups until you have used all five characteristics listed in the table. When you complete your classification system, diagram the structure of that system and show how each breed is classified.

4. Classify the following dog breeds using your classification system.

a. Great Dane: long ears, short-haired, long tail, long head, large size

b. Boxer: short ears, short-haired, shortened tail, square head, medium size

c. Shetland sheepdog: erect ears, long-haired, feathered tail, long head, small size

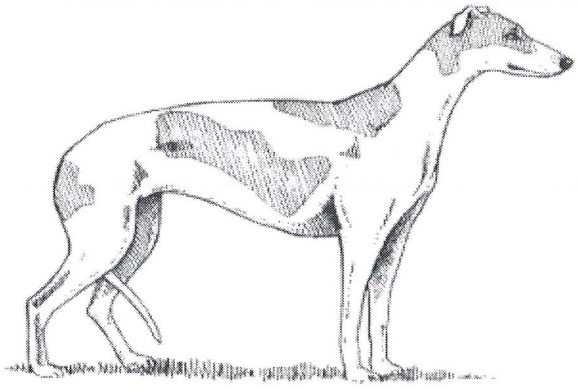
d. Airedale: short ears, wire-haired, shortened tail, long head, medium size

Science: Identifying Dog Adaptations

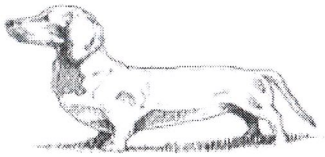
Dogs have specific adaptations that helped their wolf ancestors to survive in the wild. Match each adaptation on the left with its advantage to dogs on the right.

Adaptations	Advantages
____ **1.** keen sense of smell	**a.** catch prey much larger than themselves
____ **2.** strong, blunt claws	**b.** communicate with other dogs
____ **3.** long, slender legs	**c.** catch or bite prey while running
____ **4.** barking, howling	**d.** track prey and identify territories of other dogs
____ **5.** live in packs with dominant leaders	**e.** hunt at night
____ **6.** able to see well in dim light	**f.** run at a fast pace, with bursts of speed when necessary
____ **7.** long, powerful canine teeth	**g.** cutting and tearing meat
____ **8.** long muzzles	**h.** traction and speed on rough ground

Compare the diagrams below. Then answer the following questions on a separate sheet of paper.



Dog A



Dog B

9. Which dog do you think was bred to chase game animals out of underground dens? What characteristics of the dog make it well suited for this purpose?

10. Which dog do you think was bred to chase rabbits and catch them? What characteristics of the dog make it well suited for this purpose?

Science: Dwarf Rain Forest Animals

Some mammals found in African rain forests are very small. These dwarf animals include the royal antelope and the pygmy hippopotamus. Read the following passage about these animals.

The Royal Antelope

The royal antelope inhabits West Africa's coastal rain forests. It is the smallest antelope in the world. The royal antelope stands only about 25 cm high at the shoulder, measures about 36 cm from nose to rump, and weighs about 6.8 kg. Although the royal antelope is extremely small, it can jump about 2.8 m in one leap.

In contrast, the world's largest antelope, the eland, can grow to a height of 1.8 m at the shoulder and weigh more than 545 kg. The eland lives in the grassy savannas of central and southern Africa.

The Pygmy Hippopotamus

There are two species of hippopotamus in the world, and both live in Africa. The pygmy hippopotamus, *Choeropsis liberiensis*, lives in the rain forests of Sierra Leone, Liberia, and Côte D'Ivoire. It grows to a length of about 1.2 m and a weight of about 230 kg.

The larger species, *Hippopotamus amphibius*, can weigh more than 3,600 kg and be 4.3 m long and 1.5 m tall at the shoulder. This species lives in and near rivers flowing through flatlands in eastern and southern Africa.

Use the information in the passages above to complete the two tables below. Then answer the questions that follow on a separate sheet of paper.

Antelopes	**Height**	**Weight**	**Habitat**
Royal antelope	**1.**_____cm	**3.**_____kg	**5.**_____
Eland	**2.**_____cm	**4.**_____kg	**6.**_____

Hippopotamuses	**Length**	**Weight**	**Habitat**
Pygmy hippo	**7.**_____cm	**9.**_____kg	**11.**_____
River hippo	**8.**_____cm	**10.**_____kg	**12.**_____

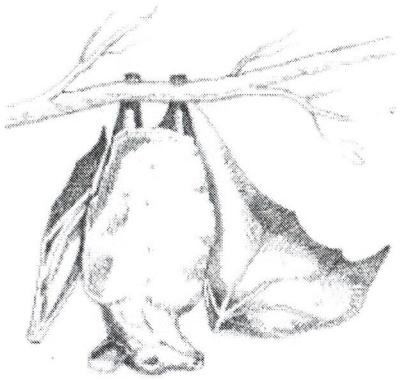
13. What is the royal antelope's length from nose to rump? What is the length of its jump? How many times longer than its body length is the length of its jump?

14. In what layer of the rain forest do you think the royal antelope and pygmy hippopotamus live? Explain your answer.

15. How do you think the small size of the royal antelope and pygmy hippopotamus make these animals well adapted to their environment?

Science: Bat Adaptations

Bats live in different biomes throughout the world. But fruit bats—or "flying foxes," as they are often called—are found only in the tropical rain forests of Africa, India, southeast Asia, northern Australia, and some Pacific islands. The following passage describes the adaptations of these bats.



Fruit Bats

Fruit bats are the largest bats in the world, with a wingspan of about 1.5 meters. A bat's wing is like a modified hand. It has four very long fingers and a shorter thumb. Leathery skin stretches across the fingers and attaches to the leg. The fruit bat's thumb and second finger have claws that help it grip objects and move around in the trees where it roosts during the day. The bat also uses its claws to bring fruit to its mouth.

As you might expect, fruit bats feed mostly on fruit. A fruit bat's canines—the pointed teeth next to the front teeth—are very long. These teeth help the bat grab and hold onto fruit. Its front teeth, or incisors, are short and strong for cutting through fruit skins. Tiny scrapers on the bat's tongue help remove fruit pulp from the skin. The bat's flat back teeth, called molars, chew and mash the pulp. Because the bat's mouth opening is small, the pulp and juice do not dribble out. The bat swallows the juice and pulp and spits out the skin and seeds. The bat often scatters the seeds as it flies.

Fruit bats also eat flower nectar. Many tropical flowers that bloom at night have a sweet scent, and fruit bats have a good sense of smell. When the bat lands on a flower, it rests its back legs on the lower petals and grips the upper petals with its claws. The bat's long, narrow muzzle and thin, flexible tongue reach deep inside the flower. As the bat feeds, pollen falls on its head. The bat then carries the pollen to another flower.

Answer the following items on a separate sheet of paper.

1. Describe how a fruit bat's claws help it survive.
2. Name the three types of teeth the fruit bat has. Describe the function of each type of tooth.
3. Besides its teeth, how else is the fruit bat's mouth adapted for eating fruit?
4. What adaptations help the fruit bat feed on flower nectar?
5. How does the fruit bat help the plants it feeds on?

Science: How to Plant Corn

The following instructions can be found on a packet of field corn. Read the instructions and answer the questions that follow on the lines below.

Culture: Plant early to assure good, dry ripeness. Sow around last frost date in spring, 2.5 cm deep, about 3 seeds per 30 cm, in rows 75-90 cm apart. Thin to 20-30 cm apart. Plant in blocks of at least 4 rows to assure complete pollination and well-filled ears. Isolate from sweet corn, because pollen from field corn will reduce its sweetness. Cultivate shallowly as plants become large to avoid trimming roots.

Harvest: Pick after husks are drying and kernels are becoming hard.

Hang or spread out in an airy place under cover to complete drying before shelling. Improperly dried corn will spoil.

Notes: Corn germinates best at soil temperature of 65-85°F (18-29°C). Many growers plant early in colder soil. Take care to avoid wet pieces of ground. We suggest treating seeds with chemicals that kill fungus to help prevent seed rot in these cold and/or wet soils. The cooler and more northerly the location, the longer field corn takes to mature.

Insect Pests: Chop or plow under corn stubble in the fall to discourage overwintering of insects such as corn borers. Where borers are evident in a crop, some control is offered with regular spraying with rotenone or pyrethrum or with other sprays recommended to kill insects.

1. There are 200 seeds in the packet and you plant four rows of seeds. Each seed is spaced the maximum recommended distance. How long are your rows of corn?

   _____

2. Do the seed suppliers expect every seed to sprout? Explain your reasoning.

   _____

   _____

3. What happens if you plant corn in cold, wet soil?

   _____

   _____

4. Would you expect corn to mature faster in Indiana or Minnesota? Explain your reasoning.

   _____

   _____

5. What is a corn borer? What does it feed on?

   _____

   _____

Science: Gravity on Mars

Sir Isaac Newton first wrote a formula that describes gravity. Newton's law established that there is a force of gravity between any two masses. We do not feel the force of gravity from objects around us because they are so tiny. Only a mass the size of a moon, a planet, or a star is large enough to have a force of gravity that we can detect. Newton's law stated that the force of gravity depends only on the masses of the two objects and the distance between them. The farther the distance, the weaker the force of gravity. Using simplified versions of Newton's law, you will compare the forces of gravity on Earth and Mars.

Answer the following questions on the lines below.

1. A simplified version of Newton's law for Earth's surface is $F = 9.8m$. In this equation, F is the force of gravity felt and m is the mass of the person on the surface of Earth. Calculate what force a person with a mass of 80 kilograms would feel. The unit of force is the newton.

2. If the person is 10,000 kilometers above the surface of Earth, the formula changes to $F = 1.5m$. Calculate what force a person with a mass of 80 kilograms would feel 10,000 kilometers above the surface of Earth.

3. A simplified version of Newton's law for the surface of Mars is $F = 4.0m$. Calculate what force a person with a mass of 80 kilograms would feel on the surface of Mars.

4. If the person is 10,000 kilometers above the surface of Mars, the formula changes to $F = 0.25m$. Calculate what force a person with a mass of 80 kilograms would feel 10,000 kilometers above the surface of Mars.

5. Calculate the forces that a person with a mass of 50 kilograms would feel on the surface of Earth and on the surface of Mars.

6. How does the force of gravity on Mars compare with that on Earth?

7. How high can you jump on Earth? How high do you think you could jump on Mars?

Science: The Polar Caps of Mars

Read the following passage about the polar caps of Mars. Then answer the questions on the lines below.

As early as 1898, scientists disagreed about whether the polar caps of Mars were made of frozen water ice or frozen carbon dioxide. The astronomer William Herschel believed that the caps were water ice, like those on Earth. In 1948 and again in 1966, scientists analyzed the spectrums reflected from the caps and concluded that the caps contained water ice rather than carbon dioxide.

In 1966, numerical models of carbon dioxide polar caps and polar caps of water ice were calculated. The behavior of the polar caps on Mars seemed to match the models for carbon dioxide polar caps. The models showed how the caps grew and declined. Data from the *Mariner* 6 and 7 spacecraft, a decade later, supported the numerical models. The *Mariner* craft performed spectral analysis on portions of the spectrum that Earth-based astronomers could not see because Earth's atmosphere absorbed these wavelengths.

More recent spacecraft observations show that the polar caps are different from each other. The northern polar cap contains more water ice. The southern polar cap contains mostly carbon dioxide ice.

1. What did early scientists assume that the polar caps had in common?

2. From where in the solar system did scientists conduct their spectral analyses in 1948? How do you know?

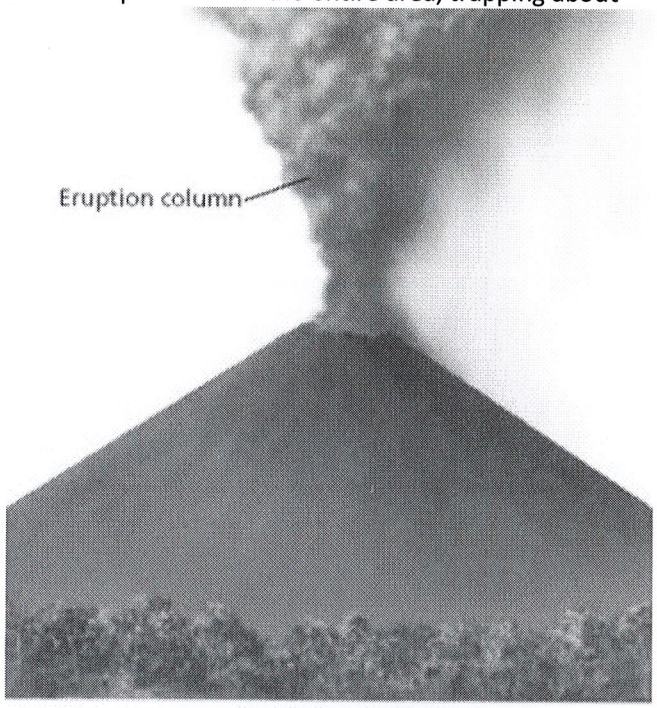
3. What information did the scientists miss in 1948 and 1966 that caused them to believe that the caps contained water ice?

4. What can you infer about the results of numerical models in 1966 for polar caps made of water ice?

5. Do you think a colony on Mars should be nearer the northern or southern polar cap? Explain.

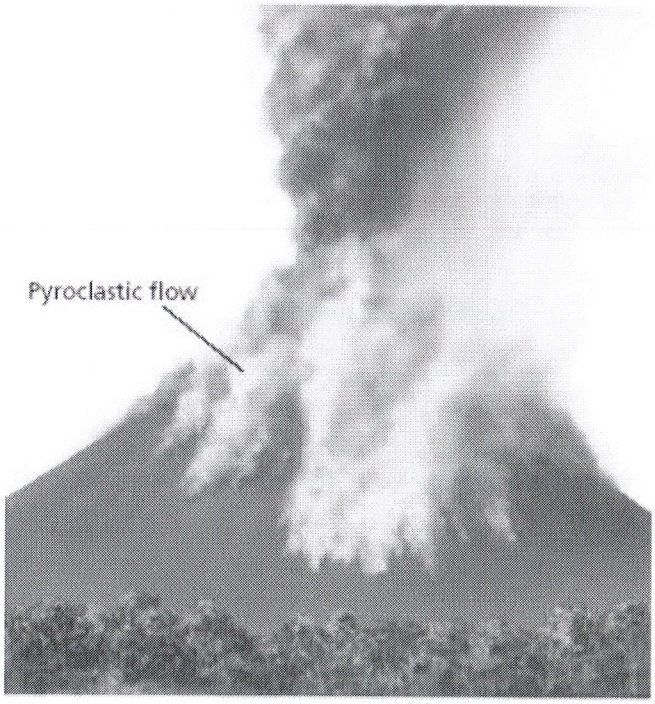
Science: Formation of a Pyroclastic Flow

Mount Vesuvius had erupted in the past, but laid dormant for hundreds of years. Then, around noon on August 24, A.D. 79, the volcano suddenly exploded. Volcanic ash and gases shot 27 kilometers into the air. During the rest of the day and into the night, 3 meters of ash blanketed Pompeii. But the destruction wasn't over. Around midnight, a deadly pyroclastic flow poured over the entire area, trapping about 2,000 Pompeians who had not yet escaped. Afterward, an additional 3 meters of volcanic debris rained down on Pompeii. This layer of material sealed the city, preserving it nearly intact for centuries.



A pyroclastic flow is a flow of hot gas, ash, and pumice that moves rapidly down the side of a volcano. Most of the people who died in Pompeii were killed by pyroclastic flows. The steps on this page show how the pyroclastic flows that destroyed Pompeii formed. During an explosive eruption like the one that destroyed Pompeii, hot gas, ash, and pumice are propelled high into the air. The column of hot gas, ash, and pumice is called an eruption column. The force of the eruption often is strong enough to cause the eruption column to move straight up. Eventually, the ash and pumice fall back to the ground.

Sometimes, the amount of ash and pumice in the lower part of the eruption column is very high. When this occurs, the lower part of the eruption column can become too dense to rise. Hot gas, ash, and pumice flow sideways down the mountain as a pyroclastic flow At night, hot pyroclastic flows often appear to glow. That is why they sometimes are called "glowing avalanches."



Science: Formation of a Pyroclastic Flow (continued)

Use the information and figures on the previous page to help you answer the questions below. Write your answers in the spaces provided

1.What is an eruption column?

_____

_____

_____

2. Why do eruption columns often shoot straight up into the air?

_____

_____

_____

3. Why might part of an eruption column collapse to form a pyroclastic flow?

_____

_____

_____

4. Why are pyroclastic flows sometimes called "glowing avalanches"?

_____

_____

5. Pyroclastic flows killed about 2,000 people in Pompeii. Why do you think pyroclastic flows are so dangerous?

Science: Volcanic Soils

Read the passage and then answer the questions below in the spaces provided.

One benefit of volcanic eruptions is the high-quality soil that develops from the ash and pumice. After an eruption, a blanket of ash and pumice covers the region near the volcano. These materials are made mostly of volcanic glass. At first, this glassy material is not good for growing plants. However, as time passes, the ash and pumice start to become fertile soil. The volcanic glass breaks down to form new materials. Important plant nutrients are released during the process. As plants grow, the surface of the soil becomes dark and rich.

Before the eruption of Vesuvius in A.D. 79, agriculture was important to the city of Pompeii. Mount Vesuvius had erupted many times before, so its slopes were fertile. People grew grapes, olives, and many other fruits and vegetables. They brought the produce to the city. There, it would be eaten or used to produce other food products, such as olive oil.

Today, the region around Mount Vesuvius remains an important agricultural area. Much of the soil in Italy is not good for growing plants. But because of the eruptions of Mount Vesuvius, the region near this volcano has fertile soil. The people who live there grow a variety of fruits and vegetables. If you ever visit this region, you might try a pizza with homemade tomato sauce and fresh vegetables. It seems ironic that the same processes that destroyed Pompeii benefit so many people today.

1. What benefit of volcanic eruptions is described?

2. What material makes up ash and pumice?

3. How does a layer of pumice and ash change through time?

4. How is soil near Mount Vesuvius unusual in the country of Italy?

5. Why do people live near active volcanoes in spite of the possibility that the volcano might erupt again?

[Note: Quotes were translated by John Bostock (1773–1846) and Henry Thomas Riley (1816–1878)]