

TCAP Test Notes

Lesson 1 Designing Experiments: **dependent variable, independent variable, scientific method, hypothesis, step-by-step, experimental, analyze data, conclusion, control, experimental, trial, problem, observation, communicate**

The _____ is a series of 7 steps a scientist follows to solve a problem or answer a question:

1. _____ : identification
2. _____ : helps you understand your problem or question better
3. _____ : a possible, testable answer or solution
4. _____ : testing the hypothesis with a controlled procedure and collect data (pieces of information)
5. _____ : study the data to figure out what the data means
6. _____ : sums up the meaning of the data and whether or not the data was supported
7. _____ : share your results to others

Experimental design follows a _____ procedure. Every experiment has _____ groups that are exposed to one change at a time and _____ groups that do not undergo any change at all. In the experimental group, the _____ is the variable that you change and the change that responds to the independent variable is the _____. A control group is necessary for a standard of comparison. Experiments must be repeated many times. Each repetition is known as a _____.

Lesson 2 Tools, Procedures, and Investigations

See your tools handout and know the tool, what it measures and in what SI units.

<u>Tool</u>	<u>Measures</u>	<u>Unit</u>
graduated cylinder	_____	_____
triple beam balance scale	_____	_____
thermometer	_____	_____
spring scale	_____	_____
beaker	_____	_____
Erlenmeyer Flasks	_____	_____
meter stick	_____	_____
stop watch	_____	_____

What is the formula for density? _____

What 3 tools could be used to measure density?

_____, _____, _____

What is the formula for velocity? _____

What 2 tools could be used for measuring velocity? _____, _____

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For the following use: **hand lens, microscope, telescope**

Name the instrument for studying the cosmos. _____

Name the instrument for studying microorganisms. _____

What would be the appropriate instrument for viewing an ant? _____

Lesson 3 Organizing Data (Graphs): **100, bar, value, whole, dependent, predictions, independent, x, y, variables, dependent variable**

Line graphs are used to show relationships between _____. Specifically these are the _____ variable and the _____ variable. Independent variables are always placed on the ____-axis and the _____ is always placed on the ____-axis. Line graphs are useful for making _____.

_____ graphs are useful for comparing sets of data. The height of each bar shows the _____ of what is being compared.

Circle graphs or pie charts displays parts of a _____ as percentages. All percentages must add up to _____ percent.

Lesson 4 Drawing Conclusions, Identifying Bias and Experimental Errors: **Bias, experimental error, conclusion, independent, dependent, y, x, volume**

A _____ is a statement that sums up what the data means and whether or not the hypothesis was supported. The conclusion should describe how the _____ variable caused the _____ variable to change. The independent variable causes the dependent variable to change. Independent variables are always on the ____-axis and dependent variables are always on the ____-axis. On page 29, the changes in temperature cause changes in the _____.

Sometimes measured values do not match the true value and _____ results.

Using measuring instruments of differing exactness will give different measurements as well as changing conditions in the lab.

_____ is a wish or expectation for a specific conclusion and it can give false conclusions. Careful observations, good data and a control helps limit _____.

Lesson 5 Developing New Technology: **design, engineers, plan for your prototype, determine need, modify the prototype, create the prototype, test the prototype and modify, determine cost-benefit analysis and risk-benefit analysis, propose an idea to meet the need**

_____ develop new technology using the _____ process.

1. _____ : identification
2. _____ : use imagination to propose a design
3. _____ : research and plan your design
4. _____ : implement the design plan
5. _____ : evaluate the model and fix any problems
6. _____ : are the cost and risks worth the benefit

Lesson 6 Bioengineering: **biofuels, genes, ethanol, herbicides, bioengineering, assistive, adaptive, biology, bioengineers, MRI machines, CAT Scans, bioengineered, insulin, bacteria**

_____ is the development of technology in the fields of _____ and medicine. Sometimes living things are changed by technology and sometimes _____ use the science of living things to create new technologies. Examples of created technology to help with diagnosis of diseases include _____ and _____. Other _____ products help treat diseases such as diabetes by using _____ to create human _____. To help those with disabilities, bioengineers design devices that either change or help an individual. _____ devices change the individual permanently and _____ devices help an individual with a need. Examples of adaptive devices include eye surgery, knee surgery and heart surgery. Examples of assistive devices include eye glasses, contact lenses, crutches and wheel chairs.

_____ are made from recently living things. One example of this is _____ which is made from corn. Biofuels may be valuable sources of energy in the future.

Growing crops with resistances to disease and with increased nutritional value, with improved taste and with prolonged ripeness is desirable. By inserting _____, traits of crops may be altered to achieve these characteristics. Sometimes _____ which kill weeds also do damage to crops. Altering a crop's resistance to herbicides would allow the use of herbicides to control weeds without damaging the crops.

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Lesson 7 Food Chains, Food Webs

Use the following terms: **respiration, herbivores, produce, photosynthesis, carnivores, scavengers, omnivores, decomposers, consumers**

Producers _____ food for themselves and _____. Consumers consume food. Producers use a process known as _____ to make food from light. Producers use another process known as _____ to change their food into usable energy for themselves. Consumers also use _____ to turn food into usable energy. Complete the following diagram which represents these processes occurring in nature.

Consumers are divided into different types based on the source of their food. _____ only eat plants. _____ only eat other consumers and _____ eat everything or plants and animals.

Some animals called _____ eat dead plants and animals. _____ break down dead material in order to recycle nutrients and necessary for life from dead organisms. Complete the graph below which represents the role of these organisms in nature.

Use the following terms: **food chains, single, food web**

Food Chains show a _____ pathway of energy flowing from one organism to another in an ecosystem. On the other hand, a _____ more accurately describes an ecosystem by showing all the pathways of energy flowing through the ecosystem. Food webs are made up of multiple _____. Give an example of a food chain from the food web below.

Lesson 8 Biomes: **deciduous forest, desert, tundra, coniferous forest, savanna, rain forest, temperate grassland, abiotic, biotic, terrestrial, freshwater, marine, biomes, aquatic**

Biomes are characterized by living factors known as _____ factors and nonliving factors known as _____. Major world communities are known as _____. The two major types of biomes are _____ and _____. _____ biomes include the salty waters known as _____ biomes and non-salty waters known as _____ biomes.

Identify the _____ biomes below by their descriptions:

1. _____ : artic, coldest, caribou
2. _____ : driest, estivation, nocturnal, hottest
Define estivation: _____
Define nocturnal: _____
3. _____ : greatest diversity, rainiest
4. _____ : mainly grasses, buffalo, prairie dogs
5. _____ : mainly grasses, exotic animals, wet/dry season
6. _____ : falling leaves in the fall
7. _____ : cone bearing trees, conifers

Lesson 9 The Universe: **quasars, black holes, universe, planetary systems, solar system, stars, gaseous, elements, spectrum, spectroscope, Milky Way, spiral, irregular, elliptical**

The _____ is made up of all the objects and energy in space.

_____ give off light and heat and are made of _____ in _____ form. By using a _____, the composition of a star can be determined by studying the _____, or rainbow of colors, of the star.

Stars with objects orbiting around them (planets) in fixed paths make up _____. Our Sun with its eight planets is known as the _____. Our solar system resides in the _____ galaxy.

Galaxies are huge collections of stars. There are three main types of galaxies. _____ galaxies have a center bulge with spiraling arms of stars. _____ galaxies are huge spheres or blobs of stars. _____ galaxies have no shape and do not fit into a category.

_____ are star like and very distant sources of light.

_____ are extremely dense and have gravity so intense that not even light can escape.

Lesson 10 Distances in the Solar System: **astronomical unit, moons, light-year, closer, larger, asteroids, meteoroids, asteroid belt, comets, dwarf planet, Oort , planets, meteorites, meteors, natural satellites**

_____ are natural satellites in fixed orbits around planets. Objects that are really close appear _____ because they are _____.

Name the following objects in our Solar System:

1. _____ : not a planet, but orbits the Sun in a fixed path
2. _____ : large chunks of rock orbiting the Sun between Jupiter and Mars in the _____
3. _____ : clumps of rock, dust and ice that forms tails when it nears the Sun. These come from the _____ cloud.
4. _____ : large round object that travels around the Sun in a fixed path
5. _____ : objects that orbit planets also called moons
6. _____ : smaller rocks traveling through space
7. _____ : smaller rocks that enter the Earth's atmosphere
8. _____ : smaller rocks from space that crash into Earth's surface

What is the common unit of distance that is used outside of our solar system? _____

What is the common unit of distance used within our solar system and is based on the average distance between Earth and the Sun? _____

Lesson 11 Days and Years: **leap year, 4, day, rotation, 365.25, 24, counter clockwise, revolution, seasons, tilt, February**

The _____ of the Earth is responsible for the day. A day is _____ hours.

The _____ of the Earth around the Sun with the _____ of the Earth is responsible for the _____ on Earth. It takes _____ days for the Earth to revolve once around the Sun. Label the diagram below identifying solstices and equinoxes and seasons for the Northern Hemisphere:

The Earth rotates in a _____ direction. Since our Earth takes 365.25 days to revolve around the Sun, we have to add one _____ every _____ years in the month of _____. This is known as _____.

Lesson 12 The Seasons: **revolution, angles, toward, away, tilt, opposite**

The seasons are because of Earth's _____ and _____.

When the axis is drawn, then the equinoxes must be on the top and bottom of the diagram. Different parts of the Earth tilt _____ or _____ from the Sun throughout the year.

Seasons for the Northern Hemisphere and the Southern Hemisphere are always the _____. This is due to the Sun's rays striking the Earth at different _____ during the year. This causes temperature differences throughout the year. Latitude determines the amount of variation in temperatures during the year. The equator is hot year around, but the poles, depending on the season, experience the most change either receiving no sun or no night. Label the diagram below:

Lesson 13 Phase of the Moon: **Lunar, waxing crescent, waxing, eight, new, last quarter, first, reflects, Sun, half, waxing gibbous, waning crescent, waning gibbous**

The moon _____ light from the _____. _____ of the moon is always lit, but we only see portions of that half depending on its position as it revolves around the Earth. There are _____ phases. When the moon is between the Sun and the Earth it is completely dark and is in its _____ moon phase. As the sun becomes more and more lit it is _____. After the new moon phase, the moon has a sliver of lit portion called the _____. Next is the _____ quarter, then the mostly lit _____ followed by the full moon. As the moon begins _____, we again see the mostly lit _____, then the last quarter followed by the sliver of lit moon called the _____. All 8 phases of the moon makes up one _____ cycle. Label the diagram below:

Lesson 14 Eclipses: **full moon phase, new moon phase, moon, solar, Lunar, Sun**

The Earth-Moon- Sun system, when aligned causes eclipses. When these three objects are in a line, then one body cast a shadow onto the other body. When the Earth is between the Sun and the _____, then the Earth casts its shadow onto the _____ and you can no longer see the _____. This is a _____ Eclipse. When the Moon is between the _____ and the Earth, then the moon cast its shadow on to the Earth and the _____ cannot be seen. This is a _____ Eclipse because the _____ cannot be seen anymore. The eclipse is named after what cannot be seen anymore. When the shadow of the Earth is on the moon and you cannot see the moon, then it is a _____ eclipse. When the shadow of the moon is on the Earth and you cannot see the Sun, then it is a _____ eclipse.

What phase of the moon does the solar eclipse occur during? _____

What phase of the moon does the Lunar eclipse? _____

Lesson 15 Earth's Tides: **neap, least, two, greatest, spring, tides, low, high, gravity, moon's, Sun, moon**

The rise and fall of the Earth's oceans are called _____. When the oceans are at their highest levels it is _____ tide. When the oceans are at their lowest levels it is _____ tide. _____ causes tides. As the _____ gravity pulls on the Earth's waters, the oceans bulges on the side of the Earth that faces the moon and on the side of the Earth that is opposite of the moon causing high tides. In between the high tides are the _____ tides. Since the Earth rotates under the moon, every position on Earth faces the moon or faces opposite the moon once every day, therefore causing _____ high tides a day and two low tides a day.

When the Earth, moon and Sun are aligned, then the highest and lowest tides occur called _____ tides. Spring tides have the _____ tidal ranges. The gravitational pull of the _____ and _____ are combined and pull on the Earth's oceans much greater.

When the Earth, moon and Sun are at right angles then the lowest high tides and the highest low tides occur and are called _____ tides. The gravitational pull of the Earth and Sun are not combined. Neap tides have the _____ tidal ranges. Label the diagrams below:

Lesson 16 Solar Energy and the Atmosphere: **global, local, poles, equator, uneven, rises, sea, from, cooler, radiation, wind**

_____ is the movement of heat across open space through electromagnetic waves.

As air becomes warmer and less dense, then the air becomes lighter and floats up and cooler more dense air sinks. In this way heat is moved around in the air and this movement is called convection. Convection is the movement of heat in a liquid or a gas. Since the Sun causes _____ heating of the Earth's surface, air moves up and down in the atmosphere and a convection current is produced. Convection currents cause _____.

There are _____ winds and _____ winds. Local winds are created in areas of water and land. Land cools faster and warms faster than water. In the morning when the Sun warms the land, the air over the land warms and _____ and is replaced by cooler air from over the sea and the breeze is called a _____ breeze. Remember that winds and breezes are named based on where they come _____. In the evening, when the land cools faster than the water, then the warmer air over the warmer water _____ and is replaced with the _____ air from the land. This is a land breeze.

Global winds are caused by the uneven heating of the Earth's surface and the Earth's rotation or Coriolis effect. Warm air rises over the equator and moves toward the _____ where it will cool and fall. Cooler air from the poles moves toward the _____ where it is warmed and it rises. Label the diagram below for global winds:

Lesson 17 Ocean Currents: **upwelling, currents, deep, density, surface, deeper, Gulf Stream**

Rivers of water run through the oceans and are called ocean _____. Some currents are at or near the _____ and others are much _____. Winds are most responsible for _____ currents. The wind tends to drag the water along. Warm water tend to flow away from the equator and cold waters from the poles flows toward the equator. The _____ is a very important surface current near the east coast of the United States and it keeps more northerly regions warmer during the winter months. Differences in temperature and in _____ are the main causes of _____ currents. Near the edges of a continent winds will blow warmer waters offshore allowing the deep nutrient rich waters to surface in an _____.

Lesson 18 Predicting the Weather: **lousy, atmosphere, air pressure, meteorologist, temperature, humidity**

Weather is the condition of the _____. _____ study weather. Conditions of the atmosphere can be determined by studying the _____, _____, and _____. _____ is the amount of moisture in the air. The weight and density of the Earth's atmosphere is called _____. Low air pressures bring _____ weather.

Tools	measure
1. Anemometer	_____
2. Wind vanes	_____
3. Thermometer	_____
4. Psychrometer	_____
5. Barometer	_____

Changing air pressure indicates _____ weather.

More humidity will lead to _____ formation and possibly a form of _____.

Warmer air holds more _____ and colder air holds _____ moisture.