

SALINE AREA SCHOOLS

COURSE OUTCOMES

Science

8th Grade

SCIENTIFIC METHOD

1. **Generate scientific questions about the world, based on observations**
2. **Design and conduct simple investigations**
 - Parts of method: *purpose/question, hypothesis, materials, procedure, data & results, conclusions*
 - Terms of method: *fair test, variables (independent and dependent) controlled variables, accuracy and population*
 - Forms of recording and reporting data: *tables, graphs and journals*
3. **Use sources of information to help solve problems**
4. **Write and follow procedures in the form of step-by-step instructions, recipes, formulas, flow diagrams, and sketches**
 - Terms: *purpose, procedure, observation, conclusion*
5. **Evaluate the strengths and weaknesses of claims, arguments, or data**
 - Aspects of an argument: *data, evidence, sampling, alternate explanation, conclusion*
6. **Describe the benefits and risks of new technologies or patterns of human activity**
 - *Risk, benefit, side effects, advantage and disadvantage*
7. **Recognize the contributions made in science by cultures and individuals of diverse backgrounds**

BASIC MEASUREMENTS

1. **Use measurement devices to provide consistency in an investigation**
 - Metric measurements: *Celsius (temperature), meters (length: millimeter, centimeter), liters (volumes: milliliters), grams (weight), tablespoon, teaspoon, ounce, cup*
 - Measurement tools: *balances, measuring tape, measuring cups*
2. **Measure physical properties of objects or substances (mass, weight, temperature, dimensions, area, volume)**
3. **Describe when length, mass, weight, area, or volume are appropriate to describe the size of an object or the amount of substance**
4. **Recognize lab equipment and be able to demonstrate correct usage**
 - *Graduated Cylinder*
 - *Triple Beam Balances*
 - *Ruler*
 - *Watch Glass*
 - *Beaker*
 - *Flask*
 - *Test Tube*
 - *Thermometer*
 - *Hot Plate*
 - *Bunsen Burner*
 - *Ring Stand Set Up*

MATTER

- 1. Describe common physical changes in matter**
 - *Changes in states of matter: condensation, evaporation, melting, freezing, thermal expansion and contraction*
- 2. Describe common properties in matter**
 - *Physical (size, color, shape, etc.) and chemical; density*
- 3. Describe common chemical changes in terms of properties of reactants and products**
 - *Examples: burning paper, rusting iron, photosynthesis, and digestion*
- 4. Distinguish between physical and chemical changes in natural and technological systems**
 - *Examples: water cycle, chewing erosions, corrosion*
- 5. Explain physical changes in terms of the arrangement and motion of atoms and molecules**
 - *Moving faster and gaining energy, moving slower and losing energy, vibrating, rotated, and conservation of matter*
- 6. Classify substances as elements, compounds, or mixtures**
- 7. Describe atoms of extremely small particles (atoms) that bond together to form molecules**
 - *Molecule, particle, matter, bond, atom*
- 8. Describe the motion and arrangement of molecules in solids, liquids and gases**
- 9. Describe the properties of acids and bases and their relationship to pH**

HYDROSPHERE

1. **Use maps of the earth to locate water in its various forms and describe common conditions under which they exist**
 - *Lakes, rivers, oceans, springs, glacier, water vapor*
2. **Describe how rainwater in Michigan reaches the ocean**
 - *Water path runoff, creeks, wetlands, rainfall, snow melt*
3. **Identify and describe regional watersheds**
 - *Drainage, basins, divides, reservoirs, tributaries*
4. **Explain how water exists below the earth's surface and how it is replenished**
 - *Water table, spring, porous, filtration*
5. **Describe the origin of pollution in the hydrosphere**
 - *Sewage, household dumping, industrial wastes, agricultural runoff*
6. **Describe how human activities affect the quality of water in the hydrosphere**
 - *Human activities, quantity of water, oceans, freshwater pollution, groundwater, water treatment*

ATMOSPHERE AND WEATHER

- 1. Describe the composition and characteristics of the atmosphere**
 - *Air, molecules, gas, water vapor, humidity, dust particles, air pressure, temperature changes with altitude*
- 2. Describe patterns of changing weather and how they are measured**
 - *Cold fronts, warm fronts, air mass, thermometer, rain gauge, wind direction indicator, weather maps, satellite weather images*
- 3. Explain the water cycle and its relationship to weather patterns**
 - *Evaporation, condensation, cooling, clouds, runoff, rain, snow, hail, fog, humidity, droughts*
- 4. Describe the health effects of polluted air**
 - *Human activities, quantity of water, oceans, freshwater pollution, groundwater, water treatment*

SPACE SCIENCE

- 1. Compare our sun to other stars**
 - *Temperature, colors, sizes, apparent and absolute brightness, double stars*
- 2. Describe, compare and explain the motion of the earth and moon**
 - *Rotation, revolution, axis, equinox, solstice, tides, phases of the moon*
groundwater, water treatment
- 3. Describe the position and motion of our solar system in our galaxy and the overall scale, age and structure of the universe**
 - *Stars, galaxies, Milky Way, spiral structure, speed of light, light year, travel times, big bang, red shift*
- 4. Explain how stars and planetary systems form and how stars produce energy**
 - *Coalescence from clouds and dust by gravity, explosion of stars producing heavy element, heavy and light elements, age of the solar system*