2nd Grade Syllabus

I. I Can Be A Scientist
   a. What is a scientist? Finding out what students already know
   b. Scientists make predictions and solve problems
      i. Using patterns to make predictions
      ii. Estimation
      iii. Test a scientific prediction
   c. Scientists use special tool
      i. Use a hand lens to observe and describe the physical properties of an object
      ii. Use a microscope to observe and describe the physical properties of an object
      iii. Use of a thermometer to measure hot, room temperature and ice water
      iv. Are big things always heavier? Using a scale to check predictions
      v. Classify objects by physical properties
   d. Scientists observe and measure change
      i. Sun and shade plant experiment
      ii. Predict and record changes in the living plant over time
   e. Famous scientists
      i. Read biographies of famous scientists
      ii. Create poster presentation about a scientist
      iii. Compare scientist lives and accomplishments
      iv. Chart the areas of science covered by the scientists
      v. Writing: How would our life be different without one invention
   f. Assessment: What does a scientist do?

II. Meet an Insect or Two
   a. Who studies insects and what tools would they use?
   b. Sort and categorize pictures of living and nonliving things
   c. Identify the parts of an insect
      i. Sort pictures
      ii. Use a hand lens to observe insects and find common body parts
      iii. What makes insects alike?
      iv. Build an insect and illustrate its habitat
      v. Assessment: label the parts
   d. Observation of living insects
      i. Record the stages of development of a butterfly
      ii. Observe what an insect needs to survive
      iii. Assessment: Draw the lifecycle of a butterfly
   e. Insects are alike and different

i. Compare pictures of butterflies to notice things that are alike and things that are different
ii. Heredity of traits: Things of the same species are alike

f. Where do insects come from?
i. Fossil evidence of insects from long ago
ii. Living things reproduce more of their own kind
iii. Environment influences growth of insects

g. Assessment: Design an insect, label its parts, create its habitat, write about how it grows and changes during its life cycle

III. The Very Important Sun and Its Energy

a. Who studies the sun and the sky and what tools would they use?
b. What is light? What do we know about light?
i. Light sources
ii. Light travels in straight lines
iii. Light can pass through some objects
iv. Light creates shadows
c. The moving earth
i. Why outdoor shadows move and change
ii. The earth's spinning gives us day and night
iii. The earth moves around the sun and gives us seasons
iv. Winter solstice – myths of the past
d. What is the sun?
i. Understanding the sun - video
ii. The sun is the closest star to earth
iii. The sun gives us heat and light energy
iv. Measuring the sun's heat energy in sun and shade
e. What else is in our sky?
i. An overview of the planets - research project
ii. What is a moon and who has one or more?
iii. Assessment: definitions of sun, moon and planets
f. Energy from the sun
i. Definition and energy video
ii. What do we get from the sun's light and heat energy?
iii. Plants need the sun's energy
iv. The food chain passes the sun's energy to us
g. Energy from other sources
i. What makes things work – a comparison of things and their energy source
ii. Build a pinwheel
iii. Build a waterwheel
h. Final assessment: Why couldn't we survive without the sun?

IV. Movement, Force, Energy and Work
- a. Who studies physical properties of objects and what tools would they use?
- b. It takes work to move an object
  - i. Move a round and a rectangular object and describe the ways it can be done
  - ii. Ramps, rolling and nonrolling objects
  - iii. Force: the power to move an object
  - iv. Tools to make movement easier: pulleys, levers, wheels and ramps
  - v. Design a movement system for a small object
- c. Objects at rest
  - i. Balancing our bodies
  - ii. Balance an object on a finger
  - iii. Balance an object on a Popsicle stick
- d. Changing the movement of an object
  - i. Spinning tops
  - ii. Rolling wheels
- e. Final Assessment:
  - i. Build a system that includes balance, force and a change in direction
  - ii. Written assessment

V. The Ocean: A Place of Wonder and Excitement
- a. What do we know about the ocean?
- b. Create an ocean habitat bulletin board
- c. Who studies the ocean and what tools would they use?
- d. Characteristics of sea creatures
  - i. What is a fish?
    1. Read about fish
    2. Label the parts of the fish
    3. Add fish to the bulletin board
  - ii. What is a mollusk?
    1. Read about mollusks
    2. Label the parts of the mollusk
    3. Add mollusks to the bulletin board
  - iii. What is a crustacean?
    1. Read about crustaceans
    2. Label the parts of the crustacean
    3. Add crustaceans to the bulletin board
  - iv. What is a mammal?
    1. Read about sea mammals
    2. Label the parts of the sea mammal
    3. Add sea mammals to the bulletin board
  - v. How are animals of the same species alike and different?
  - vi. How are animals of different species alike and different?

e. The ocean's food chain
    i. What do fish, mollusks, crustaceans and mammals eat?
    ii. Where do sea creatures get their energy?
    iii. Create an ocean food chain
    iv. What happens if one part of the food chain disappears?
f. Protection of the environment
    i. Pollution experiment
    ii. Oil in water
    iii. Effects of pollution on the ocean environment
    iv. What can we do to save our ocean? Try a service project

VI. Final Assessment
a. Write a book: If I Were a Scientist
    i. What area would I study
    ii. What tools would I need
    iii. What problem would I work on
    iv. How would I design my experiment