**Lesson Title: Introduction to the Scientific Method**

**Unit: 3 Day 1**

TEKS: 130.7.c 2 a,b,c,f,g,h

OBJECTIVES

The student shall be able to:

1. Know the definition of science
2. Know that hypotheses are tentative and testable statements
3. Know that scientific theories are capable of being tested
4. Collect and organize quantitative data and make measurements with accuracy
5. Analyze, evaluate and predict trends from data
6. Communicate valid conclusions supported by data.

TEACHING MATERIALS, TOOLS, AND EQUIPMENT

PPT: Scientific Method

This is dependent upon laboratory activity chosen. Please see bottom of the lesson to plan accordingly for your classroom.

TEACHING PROCEDURE

|  |  |
| --- | --- |
| Interest Approach/Anticipatory Set | Teacher Notes |
| Question: “What is the scientific method”  -Looking to check for students prior learning in this area  -Areas to highlight are:  The five different stages of the scientific method  Every time you research you must go through all five stages  Researchers in agriculture | Teacher initiated – Student led |

|  |  |
| --- | --- |
| Teaching Plan and Strategy / Presentation of New Material | Teacher Notes |
| Objective 1: Know the definition of science (Slide 3)  “Use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process”  --Have students read this slide aloud to aid in remembering the definition.  Once the definition of science has been discussed and repeated by students The 5 stages of research will be discussed. Objectives 2-6 are included during the 5 stages of research.  Objective 2: Know that hypotheses are tentative and testable statements  Objective 3: Know that scientific theories are capable of being tested  Objective 4: Collect and organize quantitative data and make measurements with accuracy  Objective 5: Analyze, evaluate and predict trends from data  Objective 6: Communicate valid conclusions supported by data.  The 5 stages of research   1. Formulate a question   Can refer to a specific explanation  Can be open ended  This stage involves looking up and evaluating previous research   1. Hypothesis   Based on knowledge obtained while formulating the question  Can be specific or broad  Null hypothesis  Alternative hypothesis   1. Prediction   Determining the logical consequences of the hypothesis.  Independent  Dependent  Controlled variables   1. Test   Investigation  Determine if observations agree or disagree with predictions   1. Analysis   Determining what the results of the experiment show  Lab Activity  During this time the teacher will introduce a lab activity. It does not have to be elaborate, but should be long enough to allow students to go through the entire scientific method.  Some examples would be:  Heating matter and watching it expand (i.e. a brass ball trying to go through a ring).  Changing the state of matter (solid, liquid, gas).  Thumb war/ scientific method. Measure each students thumbs and make the hypothesis that the student with the longest thumb will win the thumb war | Teacher Lectures Students take notes  Students observe a lab activity and take notes/ answer questions according to the scientific method |

ENGAGEMENT

Laboratory activity performing objective 2

EVALUATION

Short Q & A after the lab activity will be used for evaluation of the students knowledge

ADDITIONAL MATERIALS

College & Career Readiness Standards: II.C.1; II.E.7 (Write in the number/letters already crosswalked for your unit)

©Texas Education Agency, 2011