

Research Experiences for Teachers (RET) – 2011

LESSON PLAN TEMPLATE

MODULE TOPIC: **Creating, Reading and Interpreting Graphs**

RATIONALE:

Students will learn to create, read and interpret graphs. Understanding graphs is an important skill, not only for the scientist, but also for the informed citizen. We encounter information presented in graphs every day: in reading material, news reports, web sites, etc.

STANDARD(S) & INDICATOR(S):

5.1.12.A.2. Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.

5.1.12.C.2. Use data representations and new models to revise predictions and explanations.

OBJECTIVE(S):

Students will be able to:

1. Create a graph from supplied data, choosing the graph type (line, bar, pie, area, scatter) that best suits the particular data.
2. Interpret and explain the findings shown in various types of graphs.
3. Interpret graphs that accompany written material (e.g., newspaper or magazine articles) and determine whether these graphs accurately and honestly support the conclusions or claims made by the author.

MATERIALS:

- Create a Graph Tutorial, http://nces.ed.gov/nceskids/help/user_guide/graph/index.asp
- Teacher-supplied data sets for graphing practice
- Graph paper, construction paper, rulers, protractors, colored pencils, markers
- Stacks of magazines: Newsweek, Time, National Geographic, Scientific American, etc.

LIST OF HANDOUTS (attach original copies of each handout - teacher & student edition)

- Create a Graph Tutorial PDF

BACKGROUND INFORMATION:

CLASSROOM ACTIVITY DESCRIPTION (LABORATORY/EXERCISES/PROBLEMS) including detailed procedures:

Instructional Plan

- Students will learn each of the commonly used types of graphs and for what type of data each type is best suited.
- Students will then practice creating graphs by hand with supplied data.
- After grasping the basic concepts of graphing data, they will study existing graphs and explain what they indicate, and also determine how well they represent the data.

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Lesson #1: Exploring Graphs

- Students will investigate the various types of graphs and learn what each is best used for.
- Students will be shown examples of different types of graph type (line, bar, pie, area, scatter) and learn what type of data each graph type is best suited for.
- Students will complete worksheets in class from small data sets and, for each data set, explain why the type of graph is best suited for the data.
- Students will explore the various types of graphs as they are guided through the Create a Graph Tutorial web, and then use the Examples page on the same web site (<http://nces.ed.gov/nceskids/createagraph/>) to create and print several sample graphs.

Lesson #2: Creating Graphs

- Students will create hand-drawn graphs. This is preferable to making computer-generated graphs at this point, so that students develop a real feel for the relationship between the data and the graph.
- Students will be presented with several data sets. They will work in groups to figure out the most appropriate graph type for each, and then each group will graph their data.
- Homework: Students will create graphs from data sets of various types. Their work will be assessed on the neatness and accuracy of their graphs and the appropriateness of their choice of graph type.

Lesson #3: Interpreting Graphs

- Students will study, interpret and critique graphs created by others.
- Students will study both good and bad examples of graphs found in reading material. Class discussion of the strong and weak points of each graph will help to strengthen their understanding.
- As a homework assignment, each student will find a written article with graphs from a magazine, newspaper, etc., which they will bring in and critique orally for the class.

SAMPLE QUESTIONS TO ELICIT CLASS DISCUSSION:

1. Explain the criteria used to choose a type of graph (bar, line, pie, area) for a particular data set. Can more than one type of graph be used?
2. What does this graph show? (teacher presents various examples)
3. What point is the author of the graph trying to make? Does the graph clearly illustrate this point?
4. Is the graph type appropriate for the data presented? Why or why not?

HOMEWORK ACTIVITY/EXERCISES/PROBLEMS:

- Favorite Colors Bar Graph
- Favorite Animal at the Zoo – Make a Pie Chart
- Great Graphing Worksheet
- Make a Line Graph Worksheet
- Make a Bar Graph Worksheet
- Make a Pie Graph Worksheet
- And as described above in the lessons.

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PARAMETERS TO EVALUATE STUDENT WORK PRODUCTS:

- Students have chosen the appropriate type of graph for given data sets, and correctly hand-draw each type of graph.
- Students accurately interpret the information in graphs presented to them.
- Students determine whether graphs that accompany text are well-crafted and whether they clearly, accurately and honestly represent the data.

REFERENCES:

Create a Graph <http://nces.ed.gov/nceskids/createagraph/>
teAchnology <http://www.teach-nology.com>
Worksheet Library <http://www.worksheetlibrary.com>

This material is based upon work supported by the National Science Foundation under Grant Nos. EEC-0908889

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Supporting Program: Center for Pre-College Programs, at the New Jersey Institute of Technology

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