Radioactive Frosty

Summary
Students will use melting snow to create a graph showing the "decay" of the snow in Frosty the Snowman. They will solve the mystery of how long Frosty has been decomposing.

Main Core Tie
Science - Chemistry
Standard 2 Objective 2

Time Frame
1 class periods of 90 minutes each

Group Size
Small Groups

Materials
- student sheet
  (attached)
  Snow (ice cubes can be used)
  per group:
  Large funnel
  ring stand
  ring
  100 mL graduated cylinder
  stop watch or timer

Note: Extra materials will be needed for student experiment.

Background for Teachers
Time needed:
90 minutes, another activity may be needed to fill some of the melting time. (maybe Frosty the Snowman on YouTube.

Student Prior Knowledge
Students would need to have had experience graphing decay curves and know that they are based on the amount of parent element compared to daughter elements over time.

Instructional Procedures
Handout the student sheet and read the situation. Make sure the students make the link between the snow and water and a radioactive element and its daughter element.
Allow the students time to work in their groups to design a procedure to discover when the snow was brought into the room.
When students have a plan, allow them to begin their experiment.

Assessment Plan
Scoring Guide:
1. Students measure mass of water and snow to determine Frosty’s current condition.
2. Students design a plan to measure the rate of snow melt in the room.
3. Students graph the results and have enough points to see a curve.
4. Analysis questions are correctly answered:
   - Units should be grams/minute
   - Mass is the most logical.
   - Keep track of when the snow or ice was brought in.
   - Answers on graph should match data.
   - Carbon 14 and the snow are changing into Carbon 12 or water

Bibliography
Lesson Design by Jordan School District Teachers and Staff.

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