

WA 20.11 Traffic Flow Activity Backward Lesson Plan

Date: November 16, 2012

Pathway: Workplace and Apprenticeship 20 **Strand:** WA 20.11

Stage 1 – Identify Desired Results	
<p>Established Goal(s) G</p> <p>General Outcome: Establish number sense, spatial sense, logical thinking and mathematics as a human endeavor.</p> <p>Specific Outcome: WA 20.11-Extend and apply understanding of representing data using graphs including:</p> <ul style="list-style-type: none"> ◦ bar graphs ◦ histograms ◦ line graphs ◦ circle graphs. <p>[C, CN, PS, R, T, V]</p> <p>Achievement Indicators:</p> <p>c. Analyze sets of data in a variety of contexts to determine and create, with or without technology, possible graphs that could be used to represent the data and explain the advantages and disadvantages of each graph. [IC]</p> <p>e. Analyze graphs including bar graphs, histograms, line graphs, and circle graphs to determine and describe trends. [IE]</p>	
<p>Prior Knowledge P</p> <ul style="list-style-type: none"> • Mathematics 1-9 Strand: Patterns and Relations. • Students will have knowledge of how to construct and interpret various types of graphs. • Students will have knowledge what a graph is comprised of (control, title, etc). • Students will have knowledge and understanding of percentages. 	<p>Adaptive Dimensions A</p> <ul style="list-style-type: none"> • Depending on level of prerequisite knowledge, project instructions may need to be adjusted. • Adapt as necessary to various physical and intellectual disabilities. • If certain students or groups need extra time, allow them extra time without consequence. • If needed, two groups can be in the same hallway. • If students wanted to explore further, they could take data collection outside of the buildings on the sidewalks, but still on school grounds.
<p>Understanding(s) U</p>	<p>Essential Question(s) Q</p>

<ul style="list-style-type: none"> • Students will be able to relate the above knowledge to other mathematical or life situations. [C, CN, PS, R, V] • Students will be able to make educated conjectures discussing the factors affecting data. [C, PS, R] • Students will be able to make conjectures regarding graphs and what they represent. [C, PS, R, T, V] 	<ul style="list-style-type: none"> • [EQ1] What is traffic flow? [PS, R, C] <i>Expected Response: How the flow of cars are driving on the road.</i> • [EQ2] What are some human traffic flow issues that you see around the school? [V, CN, PS, R, C] <i>Expected Response: People walking on the school grounds, people walking in hallways, people walking to school, people biking to school.</i> • [EQ3] Why is analyzing graphs important in understanding data? [PS, R, V, CN][IC] <i>Expected Response: It gives us a visual aspect of what the data means, it is a way to REPRESENT the data. Graphs are also used in the financial world.</i> • [EQ4] What outside factors can skew expected data? [PR, R] <i>Expected Response: Time of data collected, events that are taking place, weather, preciseness of data taking.</i> • [EQ5] Are there presently written or unwritten rules to walking in crowds of people (hallways, streets, malls, etc)? [IC] [PS, R, CN, C] <i>Expected response: No written rules, but there are unwritten rules such as walk on the right side of the hallway, try to keep up with flow,</i>
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	<p><i>don't stop in the middle of the hallway, sometimes there is separation (bars on ramps, etc).</i></p>
<p>Knowledge K</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> Types of graphs that work best with certain types of data. [R, V, T, C] [IC] The difference between bar graphs, histograms, line graphs, and circle graphs. [CN, R, T, V] [IE] 	<p>Skills S</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> Construct graphs on computers [T, C, CN,V] Make predictions [ME] Collect data accurately and efficiently. [R, T, ME, PS] Interpret and analyze the data [R, PS, ME, CN, C] Connect their collected data to real life situations [CN, R, C] Expand problem solving and reasoning skills. [PS, R]
<p>Stage 2—Determine Acceptable Evidence</p>	
<p>Performance Task(s) T</p> <ul style="list-style-type: none"> [PT1] Have students completed their role in their management groups? Visual [C, PS, R, V] [PT2] Are students able to make the graphs on computers? [R, PS, T, V] [PT3] Students projects based on rubric. [IC, IE][PS, R, C, CN, V,T] 	<p>Other Evidence OE</p> <ul style="list-style-type: none"> [OE1] Using visual assessment and visual clues to ensure that students are on task and are understanding. [OE2] Using direct assessment by completing the graphs and presentation. [OE3] Exit slips.
<p>Stage 3—Learning Plan</p>	

Set:

- Ask students what traffic flow is. [EQ1]
- Ask students to brainstorm traffic flow issues they see inside or outside the school grounds. [EQ2]

Development:

- INQUIRY BASED LESSON [PS, R, T, C, CN, V]
- Students will be split into “management” groups of four or five to collect data based on their role they chose. Roles include: data collector (2-3 students), recorder, and communicator. Each group will collect data in a different hallway. [C, CN, ME]
- Have each group predict their data outcome. Students collect data over lunch hour.
- After data collection, each group of students will construct all four graphs on the computer (bar graph, histogram, line graph, circle graph). Handout computers to students and have them individually make a graph. [T, V, PS, R]
<http://nces.ed.gov/nceskids/createagraph/>
- After each student individually has done this, they will get back into their groups and share their graphs. Together, they will analyze which graph works best for this particular set of data and answer the guided questions that have been handed out. [R, PS, C][IC]
- After the small group discussion, the groups will present their findings (which graph works best, analysis and trends-see rubric) in a creative way they choose (ie: prezi, poster, video, song, dance, etc.)-different representation strategies [C, CN,T, V]
- After their presentations there will be a large group discussion. [C, CN]

Closure:

- Students will complete an exit slip. [PS, R]