

WAMC Lab Template

Math Concept(s): Parallel Lines cut by a transversal

Source / Text:

Developed by: Sergio Fernandez E-Mail: Fernandez.Sergio@ysd7.org Date: 06/26/24
Summer Conference 2024

Attach the following documents:

- Lab Instructions
 - Students will pair up to complete this lab.
 - Student pairs will research and choose 4 cities throughout the world. Each city from a different country. Once they have chosen their cities, they are to find two parallel streets that are cut by a non-perpendicular transversal street.
 - Once the streets have been selected, pairs are to measure the angles of the two lines and the transversal to ensure that the two “parallel” lines are parallel.
 - After determining the lines are parallel, the pairs are to identify the unique angles of Alternate Exterior, Alternate Interior, Consecutive Interior, and Corresponding Angles. Pairs will list one set of angles for each city. (Example: Denver, CO USA streets will show/list the Alternate Exterior angles; Toronto, Canada streets will show/list the Alternate Interior angles, etc.)
 - Pairs are then to present their findings by sketching the portion of the city (Landmarks, rivers, lakes, etc.) onto construction paper and be able to explain the following: the city and country, explain why they chose the city they selected, and what angle pairs are present and why those are the respective angle pairs.
 - Present their findings to the class.
- Student Handout(s)
 - Student handout with instructions on lab activity as well as guiding questions to prepare for presentation.
- Rubric and/or Assessment Tool
 - Presentation rubric

Short Description (Be sure to include where in your instruction this lab takes place):

- Students will gain understanding of how angles relate to each other when there is a pair of parallel lines that are cut by a transversal.

Lab Plan

Lab Title: Parallel Lines and Transversals around the World

Prerequisite skills: Identifying parallel lines, understanding how parallel lines and transversals create angle pairs.

Lab objective: Students will gain understanding of how angles relate to each other when there is a pair of parallel lines that are cut by a transversal. Ability to label the various types of angles that are created in this situation.

Standards: (Note SPECIFIC relationship to Science, Technology, and/or Engineering)

Mathematics K–12 Learning Standards:

- G.SRT.9 Congruence - Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.

Standards for Mathematical Practice:

- MP 1: Make sense of problems and persevere in solving them.
- MP 2: Reason abstractly and quantitatively.
- MP 3: Construct viable arguments and critique the reasoning of others.
- MP 5: Use appropriate tools strategically.
- MP 6: Attend to precision.

K-12 Learning Standards-ELA (Reading, Writing, Speaking & Listening):

- ELA – RI and ELA – W

K-12 Science Standards

-

Technology

- 1.2.1 Communicate and collaborate to learn with others.

Engineering

-

Leadership/21st Century Skills:

<u>21st Century Interdisciplinary themes</u> (Check those that apply to the above activity.)			
<input checked="" type="checkbox"/> Global Awareness	<input type="checkbox"/> Financial/Economic/Business/Entrepreneurial Literacy	<input type="checkbox"/> Civic Literacy	
<input type="checkbox"/> Health/Safety Literacy	<input type="checkbox"/> Environmental Literacy		
<u>21st Century Skills</u> (Check those that students will demonstrate in the above activity.)			
LEARNING AND INNOVATION	INFORMATION, MEDIA & TECHNOLOGY SKILLS	LIFE & CAREER SKILLS	Productivity and Accountability
<u>Creativity and Innovation</u>	<u>Information Literacy</u>	<u>Flexibility and Adaptability</u>	<u>Accountability</u>
<input checked="" type="checkbox"/> Think Creatively	<input checked="" type="checkbox"/> Access and Evaluate Information	<input type="checkbox"/> Adapt to Change	<input checked="" type="checkbox"/> Manage Projects
<input checked="" type="checkbox"/> Work Creatively with Others	<input checked="" type="checkbox"/> Use and manage Information	<input type="checkbox"/> Be Flexible	<input checked="" type="checkbox"/> Produce Results
<input type="checkbox"/> Implement Innovations	<u>Media Literacy</u>	<u>Initiative and Self-Direction</u>	<u>Leadership and Responsibility</u>
<u>Critical Thinking and Problem Solving</u>	<input type="checkbox"/> Analyze Media	<input checked="" type="checkbox"/> Manage Goals and Time	<input checked="" type="checkbox"/> Guide and Lead
<input type="checkbox"/> Reason Effectively	<input type="checkbox"/> Create Media Products	<input type="checkbox"/> Work Independently	Others
<input type="checkbox"/> Use Systems Thinking	<u>Information, Communications and Technology (ICT Literacy)</u>	<input type="checkbox"/> Be Self-Directed Learners	<input type="checkbox"/> Be Responsible to Others
<input checked="" type="checkbox"/> Make Judgments and Decisions	<input checked="" type="checkbox"/> Apply Technology Effectively	<u>Social and Cross-Cultural</u>	
<input checked="" type="checkbox"/> Solve Problems		<input checked="" type="checkbox"/> Interact Effectively with Others	
<u>Communication and Collaboration</u>		<input checked="" type="checkbox"/> Work Effectively in Diverse Teams	
<input checked="" type="checkbox"/> Communicate Clearly			
<input checked="" type="checkbox"/> Collaborate with Others			

Teacher Preparation: (What materials and set-up are required for this lab?)

Materials

- Computers (laptop)
- Drawing/color pencils/pens
- Google Maps
- Rulers/straight edge
- Construction paper
- Protractors

Set-Up Required:

- Ensure Internet is operational

Lab Organization Strategies:

Leadership (Connect to 21st Century Skills selected):

- Cooperative learning/collaborate with others/complete tasks within group (pairs)
- Communicate clearly/work creatively with others
- Prepared to present on time

Cooperative Learning:

- Students will be in pairs
- Each pair will be researching different cities and present their results

Expectations:

- Students will gain understanding of how angles relate to each other when there is a pair of parallel lines that are cut by a transversal

Timeline:

- 200 minutes for research and presentations

Post Lab Follow-Up/Conclusions:

Discuss real world application of learning from lab

- Students need to learn the relationships between angles as they are created by the parallel lines and the transversals.

Career Applications

- Civil engineering
- Land development
- City planners

Optional or Extension Activities

- Have students research building architecture throughout the world for unique buildings and then research facts about that building to be presented to class.

<https://wa-appliedmath.org/>

Washington Applied Math Council

<https://wa-appliedmath.org/>