ARTFUL MATH MAP – Geometry, Map Making, Contrast

Students use coloured pencils and fine line markers to create a map that demonstrates their understanding of mathematical concepts.

**Vocabulary**
- angle
- cardinal directions
- colour
- contrast
- neatlines
- parallel
- transversal

**Required Time**
- 100 Minutes

**Grade Level**
- Grade 4 to Grade 6

**Subject**
- Language Arts
- Mathematics
- Visual Arts
Materials

Rulers
Pencils
Drawing Paper 22.9 cm x 30.5 cm (9" x 12"")
Markers
Coloured Pencils

Shop Crayola Products

Fine Line Markers, 12 Count
Marker & Watercolour Pad, 60 Pages
Steps

Step One
1. Make a diagram that shows parallel lines crossed by a transversal.
2. Label the lines.
3. Label the alternate interior angles.
4. Label the alternate exterior angles.

Step Two
1. Plan how you want to make your map.
2. Be sure you have placed the buildings and tree in the correct spots. Refer to your labelled diagram to check the angles.
3. Remember to include the following parts on your map:
   - neatlines
   - cardinal directions
   - title
   - street names
4. Add lots of detail and a variety of contrasting colours.

Step Three
1. Check to see that you have included all the math requirements in your map.
   - 2 parallel streets
   - 1 transversal street cutting across the 2 parallel streets
   - a community centre and soccer field in alternate interior angles
   - a farm and tree in an alternate exterior angles
2. Check to see that you have included all the map components in your map.
   - neatlines
   - cardinal directions
   - title
   - street names
   - coloured details
Learning Goals

Students will be able to:

1. Create an artful map that contains the following components:
   - 2 parallel streets
   - 1 transversal street cutting across the 2 parallel streets
   - a community centre and soccer field in alternate interior angles
   - a farm and tree in alternate exterior angles
   - title
   - cardinal directions
   - neatlines; and
2. Demonstrate technical accomplishment and creativity.

Extensions

Have students work with 3 other people to:

1. Attach their individual maps to one large piece of Bristol board leaving spaces between the maps.
2. Fill in the spaces in an imaginative way to eventually the roads and communities.
3. Use a variety of media to complete the map, for example, pictures/photographs; textured papers; found objects; etc.
4. Write a saga that tells the story of the 4 students’ travels in the land they have created.
5. Share the map and the saga with classmates.

Prepare

1. Review or teach parallel lines, transversal lines, alternate interior and exterior angles.
2. Review or teach the parts of a map, in particular neatlines, title and cardinal directions.
3. Download map images from the Internet, for example, Map1
   - Old Picture Map
   - Harburg Old Map
   - Street Map
4. Gather and make available books about maps, for example, Maps, by Aleksandra Mizielinska; My Map Book, by Sara Fanelli; The Complete Book of Maps and Geography, Grades 3 - 6, by American Education Publishing; City Maps: A coloring book for adults, by Gretchen N. Peterson
5. Create a large diagram of 2 parallel lines crossed by a transversal. (If you have a magnetic white board in your class just use that.)
6. Cut out a variety of images and glue them to construction paper.

Introduction

1. View the images of maps and discuss them. Have students point out parts of the maps such as neatlines, cardinal directions/ compass rose, titles (cartouches).
   - Discuss how maps record information, and the variety of ways cartographers have added details, pictures and colour to their maps.
2. Display your diagram of parallel lines crossed by a transversal. Select students to place a picture of an object in a alternate interior or alternate exterior angle.
3. Introduce the challenge.

Activities

The Challenge

1. Create an artful map that contains the following components:
   - 2 parallel streets
   - 1 transversal street cutting across the 2 parallel streets
   - a community centre and soccer field in alternate interior angles
   - a farm and tree in alternate exterior angles
   - title
   - cardinal directions
   - neatlines
2. Demonstrate technical accomplishment and creativity.

The Process

1. Ensure that everyone understands the challenge.
2. Establish success criteria with your students, for example,
   - map accurately shows 2 parallel streets crossed by a transversal street
   - streets labelled
   - a community centre and soccer field in alternate interior angles
a farm and tree in alternate exterior angles
- neatlines
- cardinal directions
- title
- coloured details
- paper in good condition

3. Guide students through the steps outlined in this lesson plan.
4. Observe students as they work.
5. Provide individual assistance and encouragement.

Sharing

1. Once the maps are complete ask students to share them in small groups.
   Ask them to:
   - Look closely to determine whether the map meets the requirements of the task.
   - Share thoughts and opinions about what works and what can be improved.
   - Talk about how detail and colour contribute to the overall effectiveness of the map.
2. Ask some students to share their ideas with the whole class.
3. Display the images in and around the classroom so students can view them as a body of work throughout the next few weeks.

Assessment

1. Observe students as they work - thoughtful focus, discriminating, seeking more information, elaborating, experimenting
2. Observe students as they discuss the maps - active listening, insightful contributions, supporting ideas with evidence found in the artwork and from personal experience.
3. Use a checklist to track progress. (Downloads - Map_tracking.pdf)
4. Have students use the self-assessment form to reflect on their work. (Downloads - Map_self-assessment.pdf)