

Name: \_\_\_\_\_

# Geometry

## Chapter 1: Shapes and Transformations

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OR

(Zoom Meeting ID: 497 241 4613 Passcode: Bernales)



“Grit is passion and perseverance for very long-term goals. Grit is having stamina. Grit is sticking with your future, day in, day out, not just for the week, not just for the month, but for years, and working really hard to make the future a reality.”

— Angela Lee Duckworth

Researcher/Author - *Grit: Perseverance and Passion for Long-Term Goals*

### Essential Understanding

- ✓ • Transformations (translations, reflections, rotations, and dilations) are all around us.
- ✓ • Transformations provide the framework for artistic representation in many cultures.
- ✓ • Transformations are imbedded in the design of blankets, and other art in many different cultures.
- ✓ • Mathematical properties of rotations, reflection, and symmetry are found in many designs in everyday life.

### Overview:

Welcome to Geometry! Geo means Earth (geography is mapping the Earth, for example) and metry means measurement. Geometry applies the arithmetic, algebra and reasoning skills you have learned to the objects you see all around you. During this course, you will ask and answer questions such as “How can I describe this shape?”, “How can I measure this shape?”, “Is this shape symmetrical?”, and “How can I convince others that what I think about this shape is true?”

### Guiding Question:

- ✓ **Mathematically proficient students attend to precision.**

As you work through this chapter, ask yourself: How can I communicate my ideas precisely to others?

**Lessons:****Content Lesson Themes**

- \_\_\_ Making Predictions and Investigating Results
  - \_\_\_ Perimeter and Area of Enlarging Tile Patterns
  - \_\_\_ Logical Arguments
  - \_\_\_ Spatial Visualization and Reflection
  - \_\_\_ Rigid Transformations: Rotations and Translations
  - \_\_\_ Parallel and Perpendicular Lines
  - \_\_\_ Symmetry and Shapes
- 

**Assignments****9/24-9/25:****\_\_\_ 1) Class Orientation:**

- Getting to know each other
- Class Expectations (virtual and in-person)
- Class Routines (warm-up, exit ticket, individual work, etc.)
- Study Guide
- CPM e-book and other resources
- Materials needed during class
- Collaborative Learning Expectations
- Productive and Respectful Talk
- Grading System
- Tips for Success: What you need to survive and thrive in high school math
- ETC...ETC...

**9/27-9/28****\_\_\_ 2) Class Orientation continuation**

- Get- it – Together Activities, Mobile Puzzles

**8/31-9/4:****Learning Objectives:**

- ✓ Work together in teams to build symmetrical designs using the same basic shapes. You will have a brief opportunity at the end of the period to present to the class.
- ✓ Generate questions to investigate, make predictions, and test their predictions as you work with Möbius strips and related constructions.

**\_\_\_ 1) Group Activity (1.1.1): How can I design it? (20 minutes\*)**

\_\_\_ Problems: 1-1, 1-2

**\_\_\_ 2) Individual Work (1.1.1): (20 minutes\*\*)**

\_\_\_ Problems: 1-3 to 1-7

- Due Date: Wed, 9/2 (for Monday/ Thursday classes)  
Thurs, 9/3 (for Tuesday/Friday classes)

**\_\_\_ 3) Group Activity (1.1.2): Can you predict the results? (20 minutes)**

\_\_\_ Problems: 1-8 to 1-12

**\_\_\_ 4) Individual Work (1.1.2): (20 minutes\*\*)**

\_\_\_ Lesson Notes: Investigative Process

\_\_\_ Problems: 1-13 to 1-18 (pick two questions per number only)

- Due Date: Tues, 9/8 (for Monday/ Thursday classes)  
Tues, 9/8 (for Tuesday/Friday classes)

**9/8-9/11:****Learning Objectives:**

- ✓ Demonstrate understanding of area and perimeter. You will investigate how the perimeter and area of a shape change as the shape is enlarged proportionally.
- ✓ Practice how to develop a convincing argument.
- ✓ Show what an angle is and how it is measured. You will be introduced to complicated shapes composed of triangles and will begin to use attributes of sides and angles to compare and describe those shapes. (REVIEW)
- ✓ Illustrate the three rigid transformations (translations, reflections, and rotations) and identify some connections between them.

**\_\_\_ 5) Group Activity (1.1.3): How can I predict the area?****Group Activity (1.1.4): Are you convinced- Logical Arguments?**

\_\_\_ Problems: 1-19 to 1-24, 1-30 to 1-31

**\_\_\_ 6) Individual Work (1.1.3; 1.1.4, 1.1.5):**

\_\_\_ Problems: 1-25 to 1-29, 1-32 to 1-36

- Due Date: Mon, 9/14 (for Monday/ Thursday classes)  
Thurs, 9/10 (for Tuesday/Friday classes)

\_\_\_ Individual Mini Project (Lesson 1.1.5 - Angles/ Kaleidoscope) details to be discussed in class

\_\_\_ **7) Group Activity (1.2.1): How do you see it?**

**Group Activity (1.2.2): What if it is reflected more than once?**

\_\_\_ Problems: 1-47 to 1-52; 1-59 to 1-62

\_\_\_ **8) Individual Work (1.2.1, 1.2.2):**

\_\_\_ Lesson Notes: Probability Vocabulary and Definitions

Rigid Transformations

\_\_\_ Problems: 1-53 to 1-58; 1-63 to 1-67 (pick two questions to answer for each problem)

- Due Date: Mon, 9/16 (for Monday/ Thursday classes)  
Mon, 9/14 (for Tuesday/Friday classes)

\_\_\_ Individual Mini Project (Lesson 1.2.3): Slopes of Parallel and Perpendicular Lines  
(details will be discussed in class)

**9/14-9/18:**

**Learning Objective:**

- ✓ Do more translation of geometric figures on a coordinate grid and identify relationships within a shape, namely an isosceles triangle using reflection and reflection symmetry.
- ✓ Use transformations to make other shapes including rhombus, square, parallelogram, isosceles triangle, right triangle, kite, and dart.

\_\_\_ **9) Group Activity (1.2.4): How Can I move it?**

**Group Activity (1.2.5): What Shape Can I Create With Triangles?**

**Group Activity (1.2.6): What Shapes Have Symmetry?**

\_\_\_ Problems: 1-81 to 1-84; 1-90 to 1-93; 1-99 to 1-103

\_\_\_ **10) Individual Work (1.2. 4, 1.2.5, 1.2.6):**

\_\_\_ Problems: 1-85 to 1-89; 1-94 to 1-98; 1-105 to 1-109

(pick one question/letter to answer for each problem)

- Due Date: Mon, 9/21 (for Monday/ Thursday classes)  
Thurs, 9/17 (for Tuesday/Friday classes)

\_\_\_ **11) Group Activity (1.3.1): How Can I Classify This Shape?**  
**Group Activity (1.3.2): How Can I Describe It?**

\_\_\_ Problems: 1-81 to 1-84; 1-90 to 1-93; 1-99 to 1-103

\_\_\_ **12) Individual Work (1.3.1, 1.3.2):**

\_\_\_ Problems: 1-85 to 1-89; 1-94 to 1-98; 1-105 to 1-109

(pick one question/letter to answer for each problem)

➤ **Due Date: Mon, 9/21 (for Monday/ Thursday classes)**

**Thurs, 9/17 (for Tuesday/Friday classes)**

\_\_\_ Prepare for a test next class on Chapter 1

**9/21-9/22**

**ASSESSMENT:**

\_\_\_ Mini Projects: Angles and Slope of Parallel and Perpendicular Lines

\_\_\_ Test on Chapter 1

**Resources/Links:**

Textbook: Geometry Core Connections- College Preparatory Math (CPM)

E-book: <https://enroll.cpm.org/> Enrollment PIN:

CPM e-book help: <https://studenthelp.cpm.org/m/1039/1/95045-cpm-student-ebook-tour-video>

CPM Homework link: <https://homework.cpm.org/category/CC/textbook/ccg>

CPM Desmos Graphing calculator and other e-math tools: <https://studenthelp.cpm.org/m/cca/1/569920-desmos-graphing-calculator>

CPM Parent Support: <https://cpm.org/parent-support>

Other Resources: <https://www.khanacademy.org/math/geometry>

<https://curriculum.illustrativemathematics.org/HS/teachers/2/1/index.html>

## Addendum: *Class Expectations, Routines, and Procedures*

### Class Expectations

1. Each student is expected to:
  - a. attend classes **everyday, on time and be well-prepared**;
  - b. **participate actively** during class discussions and activities;
  - c. show **grace and courtesy** to everyone;
  - d. submit **neat and well-prepared** requirements at the **proper time**;
  - e. be **responsible** in making up for missed lessons, activities or assessments.
2. Adhere to the in-person and virtual class expectations as stipulated in the family handbook and which were discussed during the first community (school wide) meeting.
3. Ask questions when in doubt or when instructions are not clear to you.

### Warm Up/Exit Ticket:

1. Warm Up:
  - In your notebook, write/copy your learning objective for the week and do the warm-up on the board or screen.
  - If you don't know the answer, write down ANYTHING you know related to the concept.
  - Submit work (take a picture/save and upload on the assigned slot in Schoology).
  - Completion should take no longer than 10 minutes after class begins.
2. Exit Ticket:
  - Completed during the last five minutes of class
  - Metacognitive questions (thinking about the way you think), math problem, etc.
  - Be sure to answer in complete sentences and show all work needed.
  - Submit work (take a picture/save and upload on the assigned slot in Schoology).
  - Wait for the teacher to dismiss the class and/or check your exit ticket before you leave the classroom.

### Group Work/Group Activities: (\* usually 20-30 minutes during 1<sup>st</sup> class hour)

- Collaborative Learning Expectations
  - T    together, work to answer questions.
  - E    Explain and give reasons.
  - A    Ask questions and share ideas.
  - M    Members of your team are your first source.
  - S    Smarter together than apart.
- General Team Roles:
  - Resource Manager – get supplies for your team and make sure that your team cleans up; make sure that everyone has shared all ideas and help the team decide when it needs outside help; call the teacher over for team questions.
  - Facilitator – get your team started by having someone read the task aloud; check that everyone understands what to work on, make sure that everyone understands your team's answer before you move on.
  - Recorder/Reporter - make sure that each team member can see the work that the team is discussing; make sure that the team agrees about how to explain your ideas and each person has time to write their answer; make sure that each member of your team is able to share ideas.

Task Manager – make sure that no one talks outside your team or do other stuff other than what is assigned; help your team on task and talking about Math; listen for statement and reasons.

- Productive and Respectful Talk

Be sure to show grace and courtesy during group work always. Please read “Productive and Respectful Talk” hand-out for some start up phrases and suggestions.

- While the group is responsible for holding each other accountable, I will be keeping track of who is participating while observing your work!

**Individual Work: (\*\*usually 20 minutes during the 1<sup>st</sup> class hour and extends to the 2<sup>nd</sup> class hour as needed)**

- At most two components after each class session:
  - a. Video Lessons: Take notes on procedures not addressed during class
    - Will be posted as a material in Schoology
    - Make sure you follow along! Anything on the videos is fair game for assessments
  - b. Problem Sets: Complete the problems found in the relevant section of the CPM e-book
    - Proper responses either have work shown or context for the answer
    - Graphs are neatly created with important parts labeled
- If you are struggling, start the question or work and ask me about it during class.
- Late work will NOT be accepted.

**Absence Policy:**

- **Group Work:** You are still responsible for it even if you have an excused absence. See the study guide for the specific problems you need to complete.
- **Individual Work:** You may receive a one-class extension on the homework assigned the day you were gone.
- Check in with me immediately after school to receive credit for make-up work.

**Tips for Success:**

- If you are struggling with the content, see me sooner rather than later.
- Read the “Are you ready for high school Mathematics?” hand-out for some tips on the BASICS (what you need to survive) and BEYOND (what you need to thrive?) for high school math which will be uploaded in Schoology. *Sophomores and Juniors might find these tips useful too!*
- Take advantage of the homework help and parent support on CPM. See links provided in the study guide.

\*\*\*end\*\*\*