

Instructional Recipe

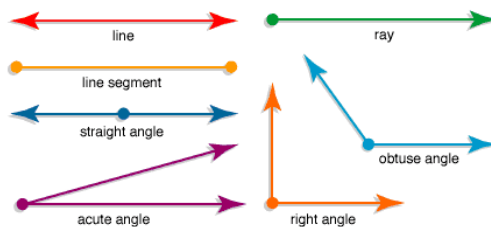
How is Geometry Reflected in Design & in Nature?

Fourth/Fifth Grade, Math

Step 1 – Ask

Objectives: Students will discover and illustrate examples of geometric figures in pictures of people, places, and things.

Introduction: Give students two straws or popsicle sticks. Review the concepts of various angles: acute, obtuse, and right angles. Review the concepts of parallel and perpendicular lines. Have students demonstrate, with the straws or sticks, each of the aforementioned geometric concepts.



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"line: geometry." Online Art. Encyclopædia Britannica Online School Edition. 1 Aug. 2008 <<http://school.eb.com/elementary/art-88092>>.

Ask:

- ★ What defines right, acute, and obtuse angles?
- ★ What are parallel lines?
- ★ What are perpendicular lines?
- ★ How are lines and angles reflected in design and in nature?

Vocabulary:

- ★ acute angle
- ★ obtuse angle
- ★ parallel lines
- ★ perpendicular lines

Math TEKS:

(4.8) Geometry and spatial reasoning. (A) identify right, acute, and obtuse angles; and (B) identify models of parallel and perpendicular lines.

English/Language Arts TEKS:
(5.5) Listening/speaking/audiences.

(D) use effective rate, volume, pitch, and tone for the audience and setting.

Technology Application TEKS:
(4) Information acquisition.

(A) apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies.

(5) Information acquisition. (A) acquire information including text, audio, video, and graphics.

(7) Solving Problems.

(A) Use software programs with audio, video, and graphics to enhance learning experiences
 (B) Use appropriate software to express ideas and solve problems including the use of word processing, graphics, databases, spreadsheets, simulations, and multimedia

(C) Use a variety of data types including text, graphics, digital audio, and video

(10) Communication.

(B) Use font attributes, color, white space, and graphics to ensure that products are appropriate for the communication media including multimedia screen displays, Internet documents, and printed materials

(11) Communication.

(A) Publish information in a variety of media including, but not limited to, printed copy, monitor display, Internet documents, and video

Step 2 – Investigate

Resources:


- ★ For a review of geometry concepts, have students search using the phrase “Lines and Angles” in Encyclopaedia Britannica Online School Edition.
- ★ Students will search EBSCO for images of nature and manmade structures, such as bridges and cityscapes, which illustrate examples of angles and parallel/perpendicular lines. Brainstorm search terms that may provide the best results. (e.g., searching for “angles” does not produce good results, but searching using the term “nature” yields a variety of useful images).



acute
angle

Step 3 – Create

Students will search/browse EBSCO's Kids Search resources and collect/save at least 20 images that feature examples of the geometric concepts being studied (parallel lines, perpendicular lines, acute angles, right angles, obtuse angles).

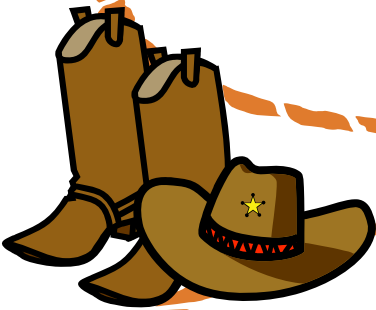
 Technology Link – Students can use the *Add to Folder* feature in EBSCO's Kids Search to collect their images in one location.



Step 4 – Discuss

- ★ Students will create a slide show of geometric concepts found in nature and manmade structures.
 - Students must use include both types of examples—natural and manmade.
 - Students must label at least one example of each geometric concept: acute angle, obtuse angle, right angle, parallel lines and perpendicular lines.
 - Labeling must be clear (e.g., colors should contrast with the background).
- ★ Students will present their slide show to the class.

🔗 Technology Link – Students can use digital cameras to photograph examples of geometric concepts in the school environment.



Step 5 – Reflect

Allow students to present their projects to the rest of the class. Use the following suggested rubric to assess the students' work. Make sure that the students are familiar with the rubric *before* they begin creating their project. They should refer to the rubric repeatedly to monitor their progress in creating their project.

🔗 Technology Link: You can also create your own rubric with your students at <http://rubistar.4teachers.org/index.php>.

Rubric—Geometric Concepts Slide Show

CATEGORY	4	3	2	1
Requirements	All requirements are met and exceeded.	All requirements are met.	One requirement was not completely met.	More than one requirement was not completely met.
Content - Accuracy	All content throughout the presentation is accurate. There are no factual errors.	Most of the content is accurate but there is one piece of information that might be inaccurate.	The content is generally accurate, but one piece of information is clearly flawed or inaccurate.	Content is typically confusing or contains more than one factual error.
Use of Graphics	All graphics are attractive (size and colors) and support the theme/content of the presentation.	A few graphics are not attractive but all support the theme/content of the presentation.	All graphics are attractive but a few do not seem to support the theme/content of the presentation.	Several graphics are unattractive AND detract from the content of the presentation.
Preparedness	Student is completely prepared and has obviously rehearsed.	Student seems mostly prepared but might have needed a couple more rehearsals.	The student is somewhat prepared, but it is clear that rehearsal was lacking.	Student does not seem at all prepared to present.
Speaks Clearly	Speaks clearly and distinctly all (100-95%) the time, and mispronounces no words.	Speaks clearly and distinctly all (100-95%) the time, but mispronounces one word.	Speaks clearly and distinctly most (94-85%) of the time. Mispronounces no more than one word.	Often mumbles or can not be understood OR mispronounces more than one word.
Volume	Volume is loud enough to be heard by all audience members throughout the presentation.	Volume is loud enough to be heard by all audience members at least 90% of the time.	Volume is loud enough to be heard by all audience members at least 80% of the time.	Volume often too soft to be heard by all audience members.
Stays on Topic	Stays on topic all (100%) of the time.	Stays on topic most (99-90%) of the time.	Stays on topic some (89%-75%) of the time.	It was hard to tell what the topic was.