

Alp Eren Vural

A geometry lesson plan with ADDIE model

Analysis

- The topic is some triangle features for 10th graders.
- Learners know definition of triangles, auxiliary elements from previous years.
- Learners have very basic knowledge of computers. They can use keyboard and mouse. They are also familiar with videos.

Design

Learning objectives	Teaching strategies	Learning activities	Supplement resources	Assessment	Technology
MAT.10.4.1. Being able to make inferences regarding trigonometric ratios (sine, cosine, tangent, cotangent) in right triangles and trigonometric identities.	Flipped Classroom, followed by cooperative learning	Students watch the instructional video at home. Think-pair-share activity on class.	A practice sheet for group activity	A short quiz	Video
MAT.10.4.2. Being able to make inferences regarding the properties of the auxiliary elements (centers/lines, e.g., bisectors, medians, altitudes) of a triangle.	Guided Discovery / Inquiry-Based Learning	Students tries to make inferences by exploring triangles on Geogebra.	A paper for students to note their conjectures	Their final work will be collected as formative assessment.	Geogebra
MAT.10.4.3. Being able to make inferences regarding the change in a triangle's area depending on the change in one of its sides and the altitude belonging to that side.	Direct teaching, Guided Discovery	The teacher teaches the topic directly then students answers the questions by discovering via geogebra.	A paper for students to write their answers, a board for the lesson	Students' answers from the geogebra activity.	Geogebra

Mat.10.4.1

Development

Watch the instructional video at home.
Then do the group activity on class.

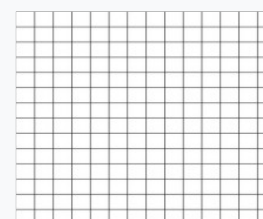
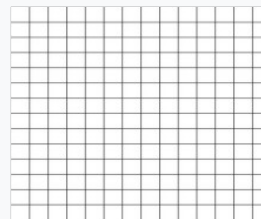
[Video link](#)

In the end of the class, do this quiz
from geogebra.

[Geogebra quiz](#)

Divide in groups. Each group will assign a specific right triangle such as 3-4-5, 8-15-17, 6-8-10.

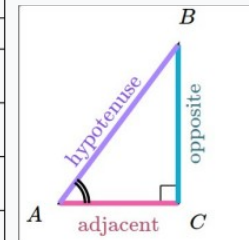
1) Draw the triangles that is given to each group.



2) Make assumptions about relation of your drawn triangles' side ratios by its acute angle.

3) Complete your part below with your group friends. After that present solutions to the class and fill the rest of the table.

	Group 1	Group 2	Group 3
	For A	For A	For A
$\frac{\text{opposite}}{\text{hypotenuse}} =$			
$\frac{\text{adjacent}}{\text{hypotenuse}} =$			
$\frac{\text{opposite}}{\text{adjacent}} =$			
$\frac{\text{adjacent}}{\text{opposite}} =$			



Mat.10.4.2

Development

In this lesson, you will do the given geogebra activities to you. You need to experiment with the tools given to you and make generalizations and conjectures from them.

[Geogebra link for medians](#)

[Geogebra link for bisectors](#)

[Geogebra link for auxiliary elements](#)

Mat.10.4.3

Development

Answer the questions below after experimenting the claims with geogebra.

- What happens to area of the triangles if its altitude is decreased?
- If the base of the triangle and its perpendicular altitude are kept same but the other side of the triangle is increased. How does the area change?
- If the base is changed. What would happen to the area of a triangle?
- The area of the triangle is dependent on _____

[Geogebra link](#)

Mat.10.4.1 Implementation

- The teacher needs to implement a flipped classroom. Students study the topic directly via the lesson video. Then, students ask their questions and practice in the class
- In the group activity, teacher must avoid giving too much hints. Students must think the given question by themselves. Then, share with their group friends. Finally, they share their answers with the whole class.

Assessment

- The teacher will take students' answers and their group work as formative assessment.
- A quiz from geogebra will be given in the end of the lesson for summative assessment.

Mat.10.4.2 Implementation

- The teacher must be sure that all of the students can access computer for geogebra activity. The teacher needs to be familiar with geogebra so that they can answer students' questions about the platform. Students need to have very basic knowledge for geogebra which teacher can teach them during lesson
- Students will experience discovery learning with the geogebra activity. They will make generalizations and conjectures. They will share their findings in the class.

Mat.10.4.3 **Implementation**

- Teacher teaches the topic directly to the class. Then, students will answer given questions by visualizing the claims on geogebra.

Assessment

- Students' answers will be collected for the formative assessment.

Evaluation

The lesson plan actively involves students. So, they are not passive learners anymore but they try to make conjectures and explain them to their classmates. This is the strength of my plan but I could prepare more appropriate geogebra activities to avoid the need of direct teaching and let students to control the lesson. Preparing such activities were difficult to me. So, I just let my activities to visualize what they learned although I also make them to discover some triangle facts.

Evaluation

In terms of availability, the lesson plan requires a school with working computer room. Some schools might not to meet the requirements. Also, students need to reach some sort of screen to watch the instructional video for flipped classroom approach. This might be not possible for every school so abandoning the flipped classroom idea and make them watch in the classroom might be better.

Sources

- I have used khan academy's video and some geogebra activities as outside sources.
- Geogebra activities that has the author name Eren_ are mine.