

Lesson Plan Session 3 (investigating shapes)

Presenting GeoGebra Practical Session

General aspects:

1. *Learning Goals:*

To develop an understanding of the use of GeoGebra in mathematics teaching

To develop problem solving and - posing skills using GeoGebra as a technological tool

2. *General strategy:*

Working practically in GeoGebra, alongside discussing the use of technology

3. *Structure*

Lesson segments: work in groups of three investigating GGB, using the spreadsheet and GGB, logging in to the GeoGebra materials on the website, logging in to a GGB group and sharing materials.

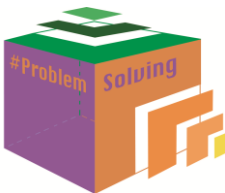
1. *Structure*


Lesson segments: working with photos, focusing on mathematical concepts and reasoning

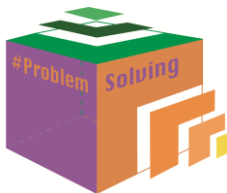
2. *Resources:*

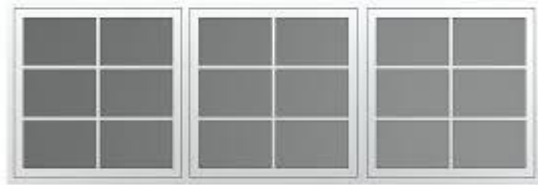
Folder with photos, camera/smartphone, Screencast-O-Matic or Screencastify (freeware)

Development of the Lesson:

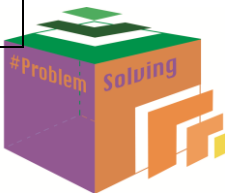



Task and Learning Activities	Expected Duration	Class Activity (potential difficulties)	Instructor Support	Goal and Assessment
Introduction	5 mins	Talk about relevant photos for this activity, where you are going to investigate different photos. It must be possible to find different shapes, calculations, patterns and other relevant mathematical issues.		<i>Goal:</i> the students are able to find relevant photos/pictures with mathematical issues.
'Photo-hunt'	20 mins	<p>Let the students go out and find relevant pictures, which they can use for investigation in GGb.</p> <p>A couple of examples:</p> 	It is a good idea to show examples to scaffold the students' ability to look for the important mathematical content.	

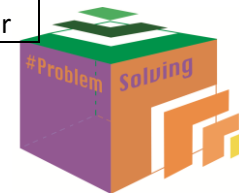




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Task and Learning Activities	Expected Duration	Class Activity (potential difficulties)	Instructor Support	Goal and Assessment
Import photos into the graphics	35	<p>Use the facilities from session 2 to import the photos.</p> <p>Draw upon the photos to find different shapes, functions, arithmetic or something quite different - use your imagination ☺</p> <p>In this picture, a circle is drawn through three points and the segments are reflected in the lines passing through the centre of the circle - you may also make rotations and other geometric properties.</p> 		
Make a screencast	35	<p>The students make a screencast of their investigations in GGb. Depending on which computer they have access to they can use different freeware:</p> <p>If you are working on a PC or a Mac, you may use: https://screencast-o-matic.com/</p> <p>If you are working on a Chromebook, you may use: https://www.screencastify.com</p>	<p>It is important to scaffold the students in their productions. Beware of their use of mathematical concepts, the length of their screencast (max 2 min.) and notice that it is possible in GGb to make the construction and afterwards use the tool Construction Protocol, where it is possible to ‘play’ your construction while you are making the screencast. This tool gives the student</p>	<p><i>Goal:</i> The students develop their skills in communication of mathematical concepts and reasoning.</p> <p><i>Assessment:</i> The students work in pairs or in groups:</p> <ol style="list-style-type: none"> 1. They send their screencast to each other



time to think and choose the right words, because he/she already has made the construction and now can focus on the content of the speak.

and give each other feedback.
2. They pick - in cooperation with the teacher - the screencast they find most suitable to show to the class. The class gives feedback on the screencast.
3. All students send their screencast to the teacher who gives feedback on them.

The screenshot shows a software interface with a list of objects on the left and a playback control bar at the bottom. The list includes:

Name	Description	Value	Category
1 Point A		A = (2, 0)	
2 Point B		B = (16, 0)	
3 Image pic1		pic1	
4 Point C		C = (6.98, 5.32)	
5 Point D		D = (8.82, 3.48)	
6 Point E		E = (10.2, 6.4)	
7 Circle c	Circle through C, D, E	$c: (x - 8.78)^2 + (y - 5.28)^2 = 3.25$	
8 Point on c		F = (8.82, 7.09)	
9 Point G		G = (7.49, 4.03)	
10 Segment f	Segment F, G	f = 3.34	
11 Segment g	Segment D, F	g = 3.61	
12 Point H	Point on g	H = (8.82, 5.3)	

At the bottom, a playback control bar shows a play button, a progress indicator at 1/20, and a speed control set to 2 seconds.

Play

Speed of play

