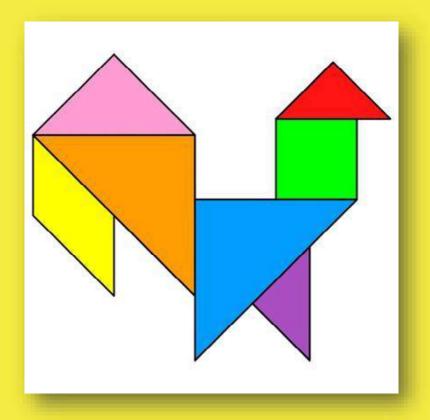
6 Mathematics: The World of Shapes and Units

[Year 4]



Lesson 1 topic: Shapes are fun

Lesson 2 topic: Fractions in action

Lesson 3 topic: Let's play! Let's weigh!



This module was designed for year 4 and it comprises the following 3 lesson topics:

Lesson 1 topic: Shapes are Fun

Table 13 - The World of Shapes and Units. Lesson 1: Activities & Appendixes

Activities	Appendixes
Lead-in	
1	
2	1
3	2

Lesson 2 topic: Fractions in Action

Table 14 - The World of Shapes and Units. Lesson 2: Activities & Appendixes

Activities	Appendixes
Lead-in	
1	1
Fast finishers	2
2	3 and 4
3	5
Fast finishers	6

Lesson 3 topic: Let's Play! Let's Weigh!

Table 15 - The World of Shapes and Units. Lesson 3: Activities & Appendixes

Activities	Appendixes
Lead-in	
1	1
2	2
3	
4	3



6.1 Mathematics - Lesson 1: Shapes are Fun

Linguistic objective

<u>Vocabulary</u>: students get to know the names of shapes and geometrical shapes (*triangle, square, rectangle, circle, diamond/rhombus; star, heart; shape, side, area; top, bottom, left, right, near*)

<u>Structures</u> (it's a square, it's got four sides; it's at the top, on the left; how many squares are there on the left/right?; my tangram is a cat, it's got two red ears...)

Linguistic objective

<u>Skills</u>: students understand simple information from an authentic video (listening); students interact with the teacher to answer questions about a video/a picture/a tangram (speaking); students read and answer questions to carry out a task (reading, writing); students describe their tangram figures (speaking)

Linguistic objective

Functions: students create tangrams with 7 various figures and describe their pictures.

Content objective

Students name selected geometric figures and their space relations; recognize the characteristics of geometrical shapes (the number of sides); compare the area of the square tangram and the tangram figure. They use geometrical instruments to measure and calculate the perimeter or area.

Communication

Students describe tangram pictures for other students to guess.

Cognition

Perception – noticing shapes and their space relations in the pictures/videos; noticing shapes in a tangram figure; calculating area or perimeter.

Culture

Students get to know where a tangram comes from.





INTRODUCTION: 10 MIN

GAME: Students get involved in the lesson by playing a game. The students receive
coloured geometric shapes with the name of the shape (triangle, circle, square,
rectangle, and diamond/rhombus).

Students stand up and make a circle.

```
T: Stand up and make a circle.
```

Teacher gives instructions and then she/he calls the shapes:

```
T: Make one step forward when you hear your shape: triangles, squares...).
```

• Teacher gives other instructions and students form groups divided by shape.

```
T: triangles go near the door, circles go near the window...
```

• Then children follow teacher's instructions and hold shapes up or put them down. The teacher explains and demonstrates first.

```
T: When I say squares up, you hold your square up; when I say circles down, you put down your shape. Let's try: squares up and circles down...
```

• One student from each shape group comes to the board, draws his/her shape and labels it. Students copy the figures and the names into their notebooks.



ACTIVITY 1: 15 MIN

 Students watch a video and name the shapes they recognise/remember. Video 1: https://www.youtube.com/watch?v=v38vp3IwLho

The video provides very basic information on geometric figures.

T: Let's watch a video about geometric shapes.





- Teacher plays the video, stopping it after every shape and asks questions:
 - T: What shape is it? How many sides has it got?
 - T: Name an object with the same shape in the video.
 - T: Name an object with the same shape in the classroom.

With the last shape, teacher asks:

T: What can you see on the left/right/in the middle?

• Teacher writes the last question and a model for the answers on the blackboard and students answer in their notebooks.

I can see...

on the left:

on the right:

in the middle:



ACTIVITY 2: 20MIN - PICTURES/IMAGES (LINK + EXERCISE)

• Teacher shows students a painting by Paul Klee:

http://www.italnews.info/2014/04/20/tunisia-paul-klee-e-i-tappetitunisini/#!prettyPhoto/0/





• Teacher divides students into groups and asks them:

T: What geometric shapes can you see and what do they represent in this painting? What do you think the title of this painting is?

Key: Dream City

• Then teacher shows students a masterpiece by August Herbin:

http://www.progettoinfanzia.net/august-herbin-e-le-forme-geometriche/



This is a painting by August Herbin. This artist also uses geometrical shapes. What geometrical shapes can you see?



• Teacher gives each group a worksheet (*Appendix 1*). At the end, the groups compare their results. Teacher asks the first question and one student from each group reads the answer. Then she/he asks the second question and so on. In each group students take turns to answer.

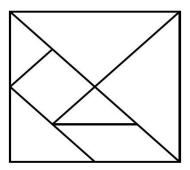


Fast finishers: students create their own paintings, based on geometrical shapes, using crayons/felt tip pens/pencils...



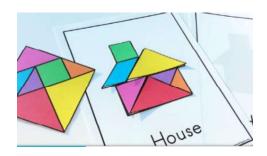
ACTIVITY 3: 45 MIN – GAME OR HANDS-ON EXPERIMENT/GAME/CRAFT (LINK + EXERCISE)

• FINAL CRAFT: Each student is given a worksheet with a square tangram (*Appendix 2*): http://blocs.xtec.cat/anglesbogatell/files/2012/02/1.png



• Teacher says that it is a square tangram. Then he/she explains what a tangram is and shows another picture: http://mseirin.blogspot.com





T: Look at the picture of the house. How many geometrical shapes can you see? What are they? This figure is the tangram, it is always made of 7 shapes. The tangram comes from China.

Then she/he invites children to colour their square tangrams.

T: Now colour all the shapes of your square tangram with different colours.

• Students receive another square tangram (*Appendix 2*). They colour all the different parts identically as the first tangram and this time they cut out all the 7 geometric shapes and then create a tangram figure of their choice.

T: Colour the shapes of this second tangram with the same colours as the first one. Cut them out. Use the 7 shapes to create a figure: an animal, a flower, an object..

• Students are involved in activities based on the notion of area and perimeter. The teacher can choose one of the following tasks, selecting an appropriate one keeping in mind the students' level and the school curriculum.

Option 1: Students are asked to put the shapes of their tangram figure back into a square tangram again. Then they calculate the perimeter of this square tangram and of the square tangram they have on the worksheet.

T: Sorry, now we say bye-bye to your cats, rabbits...You collect the 7 shapes and you form a square tangram, like the one you have on your worksheet. Are the 2 square tangrams identical or not? Use your ruler, measure and calculate the perimeter.



Option 2: Students are asked to compare the areas of their square tangrams and of their tangram figures. Students calculate the area of the square tangram and of the 7 parts of tangram figure and of the whole tangram figure.

T: What's the area of the square tangram? Measure with your ruler, then calculate. What's the area of each of the shapes of your tangram figure? Measure with your ruler than calculate. What's the area of the whole tangram figure?

Option 3: Students are involved in a problem solving activity. They are asked to calculate the area of their tangram figure and then to calculate the side of a square of the same area.

T: What's the area of your tangram figure? Measure with your ruler, then calculate. How long is the side of a square tangram of the same area, like the one you have on your photocopy?

Each student receives a paper shopping bag labelled "MY TANGRAM BAG".

T: Now you can use your shapes to create a tangram figure again. Then stick it on the bag creating your own personal tangram bag.

The students stick all the pieces of the tangram on the shopping bag, creating their own tangram (a house, an animal or whatever they decide).

At the end students work in groups of 5. They place their bags on the floor and take turns to describe a selected picture for the others to guess.

T: In this picture I can see two blue triangles and an orange square...

The bags should be similar to the ones of the pictures below, but they should have just the seven pieces of the tangram, not other geometrical shapes.)







Fast finishers: students create another tangram bag for a friend.



6.1.1 SHAPES - LESSON 1 - APPENDIX 1

LOOK AT AUGUST HERBIN'S PAINTING AND COMPLETE THE GRID

SHAPES	NAME	NUMBER	ON THE LEFT	ON THE RIGHT
	MOON	6 SIX	3 THREE	3 THREE

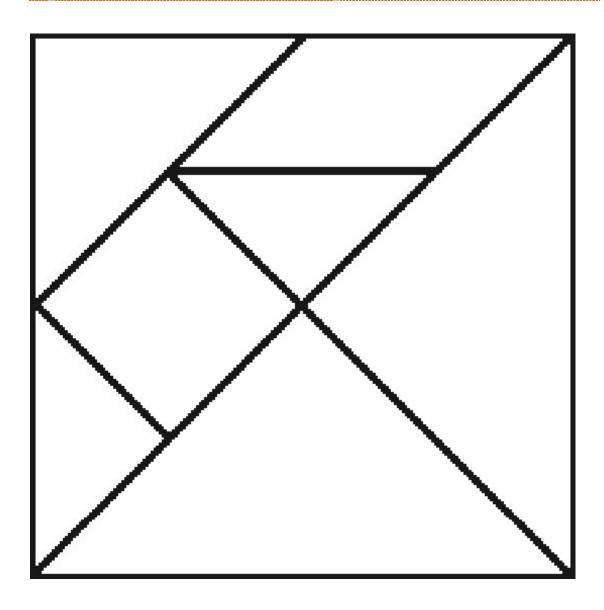
1.	HOW MANY <u>MOONS</u> ARE THERE IN THE PAINTING? THERE ARE MOONS
2.	HOW MANY MOONS ARE THERE ON THE LEFT? THERE ARE
3.	HOW MANY MOONS ARE THERE ON THE RIGHT?
4.	HOW MANY <u>CIRCLES</u> ARE THERE IN THE PAINTING?
5.	HOW MANY <u>CIRCLES</u> ARE THERE ON THE LEFT?
6.	HOW MANY <u>CIRCLES</u> ARE THERE ON THE RIGHT?
7.	HOW MANY TRIANGLES ARE THERE IN THE PAINTING?



8.	HOW MANY TRIANGLES ARE THERE ON THE LEFT?
9.	HOW MANY TRIANGLES ARE THERE ON THE RIGHT?
10.	HOW MANY GEOMETRICAL SHAPES ARE THERE IN THIS PAINTING?



6.1.2 SHAPES - LESSON 1 - APPENDIX 2





6.2 Mathematics - Lesson 2: Fractions in Action!

Linguistic objective

Students know appropriate terminology about fractions (whole, part, fraction, part of a whole, nominator, denominator, half, third, fourth, fifth, sixth, seventh, eighth...)

Linguistic objective

Students understand simple information from an authentic video.

Linguistic objective

Students present the posters with fractions and their graphic representations.

Content objective

Students understand the notion of fractions and their representations.

Communication

Students invent and communicate the names of their pizzas.

Students say how many parts of the pizza they can see.

Students name the fractions.

Cognition

Analyzing and assessing – students analyze and correct each other's worksheets.

Culture

Students get to know where pizza comes from and it was originally invented.



INTRODUCTION: 15 MIN

• **GAME**: Students get involved in the lesson by playing a game. The students pick up from a box one part of different pizzas (that were printed in colours and cut in 4 equal parts). They look for other students who have a part of the same pizza. They collect these four parts together and they make up a "fantastic name" for their pizzas (e.g. Volcano, Italian, Forest, Yummy pizza....).

T: Pick up a part of a pizza from the box.

Find three other parts that come from the same pizza, put them together.



Now you are a group and you make up the name of your pizza.

Do you know where pizza was originally invented?

If students don't know it, the teacher says:

In Naples, in southern Italy.

https://www.google.pl/search?q=clipart+pizza+da+colorare&espv=2&biw=136 6&bih=662&source=lnms&tbm=isch&sa=X&ved=0ahUKEwigzePInK3QAhWEhi wKHZDqCYQQ AUIBigB#tbm=isch&q=clipart+pizza&imgdii=85QeR7NfWPAHf M%3A%3B85QeR7NfWPAHfM%3A%3Br1gJkzw1yyFQ3M%3A&imgrc=85QeR7N fWPAHfM%3A	
https://www.google.pl/search?q=clipart+pizza+da+colorare&espv=2&biw=136 6&bih=662&source=lnms&tbm=isch&sa=X&ved=0ahUKEwigzePInK3QAhWEhi wKHZDqCYQQ AUIBigB#tbm=isch&q=clipart+pizza&imgdii=85QeR7NfWPAHf M%3A%3B85QeR7NfWPAHfM%3A%3BKezB1VzEAQu09M%3A&imgrc=85QeR7 NfWPAHfM%3A	
https://www.google.pl/search?q=clipart+pizza+da+colorare&espv=2&biw=136 6&bih=662&source=lnms&tbm=isch&sa=X&ved=0ahUKEwigzePInK3QAhWEhi wKHZDqCYQQ AUIBigB#tbm=isch&q=clipart+pizza&imgrc=4Zz0ZBXMBH0FSM %3A	
https://www.google.pl/search?q=clipart+pizza+da+colorare&espv=2&biw=136 6&bih=662&source=lnms&tbm=isch&sa=X&ved=0ahUKEwigzePInK3QAhWEhi wKHZDqCYQQ AUIBigB#tbm=isch&q=clipart+pizza&imgrc=QSmc6o208SOgVM %3A	
https://www.google.pl/search?q=clipart+pizza+da+colorare&espv=2&biw=136 6&bih=662&source=lnms&tbm=isch&sa=X&ved=0ahUKEwigzePInK3QAhWEhi wKHZDqCYQQ_AUIBigB#tbm=isch&q=clipart+pizza&imgrc=JaG3MhwjbVji6M% 3A	

T: Have you finished? Have you got the WHOLE pizza?

How many parts has your pizza got?

• Teacher writes on the board:

4



Then she/he hides a part of the pizza and asks:

T: How many parts has the pizza got now?



Teacher writes on the board

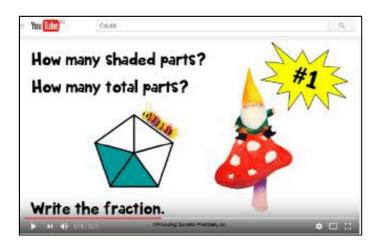
T: These are 3 parts of the 4 and we say three forth.

This is a FRACTION. Let's watch a video with more fractions.



ACTIVITY 1: 15 MIN

• Students watch a video. Video 1: https://www.youtube.com/watch?v=JX6x5021hp0

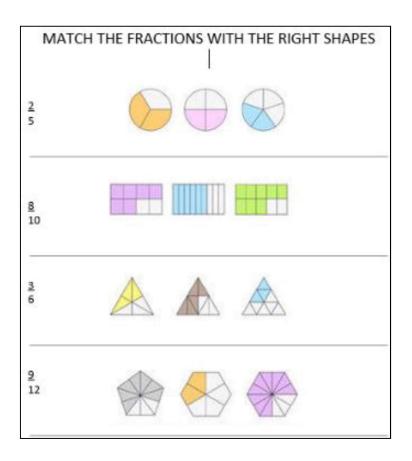


At the end students complete the handouts on Appendix 1: "Shapes and fractions".
 The teacher checks the students' answers.



Fast finishers: complete a second handout: Appendix 2: "Match the Fractions and the right shapes".







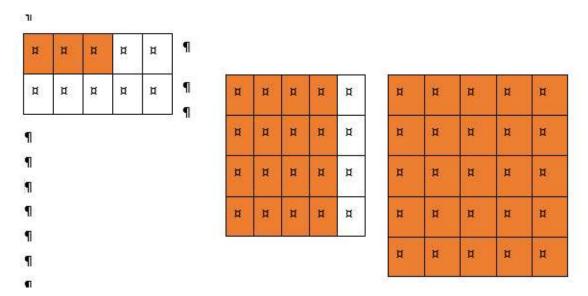
ACTIVITY 2: 20 MIN – PICTURES/IMAGES (LINK + EXERCISE)

• Teacher attaches some images around the classroom and says:

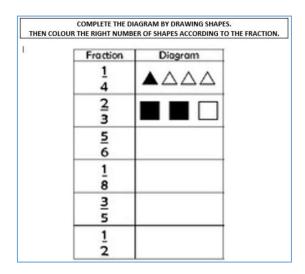
```
T: Show me the picture which represents 3/10; point to the picture that represents 16/25; point to...
```

• Students go around the classroom, point to the right pictures and say the fractions.





Teacher gives students a worksheet to complete (Appendix 3: Complete the diagram).



Students swap their worksheets and check them.

Students invent, write and draw other fractions similar to the previous task (*Appendix 4: Complete the diagram*).



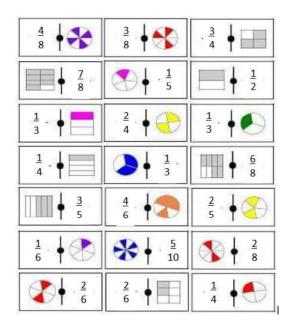
Fraction	Diagram



ACTIVITY 3: 40 MIN – GAME OR HANDS-ON EXPERIMENT/GAME/CRAFT (LINK + EXERCISE)

GAME: Teacher cuts out each card in halves. (Appendix 5: Match the fractions and their representations). He/she shuffles the cards and gives a card to each student. Students have to match the fractions with their graphic representations.

T: Match the fractions with their graphic representation.



FINAL CRAFT



Students create two posters with the cards from the previous task (one poster for circles and one for quadrilaterals). Finally, they decorate the posters.

OR REVISION

Students sit in a circle. In the middle of the circle teacher puts mixed fraction cards face down in a pile. Students one by one take one fraction card from the pile and read it out. E.g.

I have a fraction two thirds.

The rest of the group shows the fraction using their fingers (the left hand represents the numerator and the right, the denominator). During the task students may practise the pronunciation of 'denominator'.

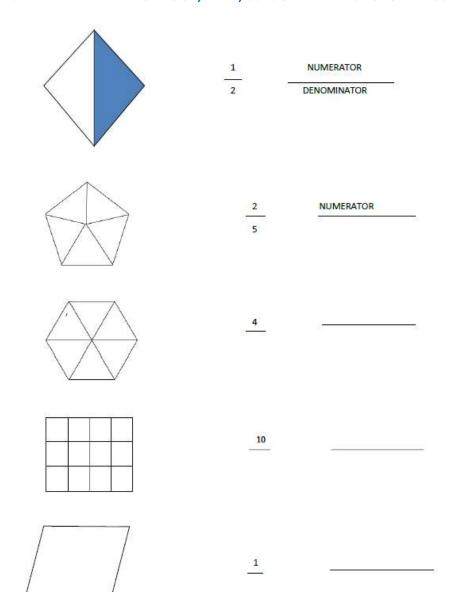


Fast finishers. Students complete a fraction handout (*Appendix 6 - Colour the fractions*).



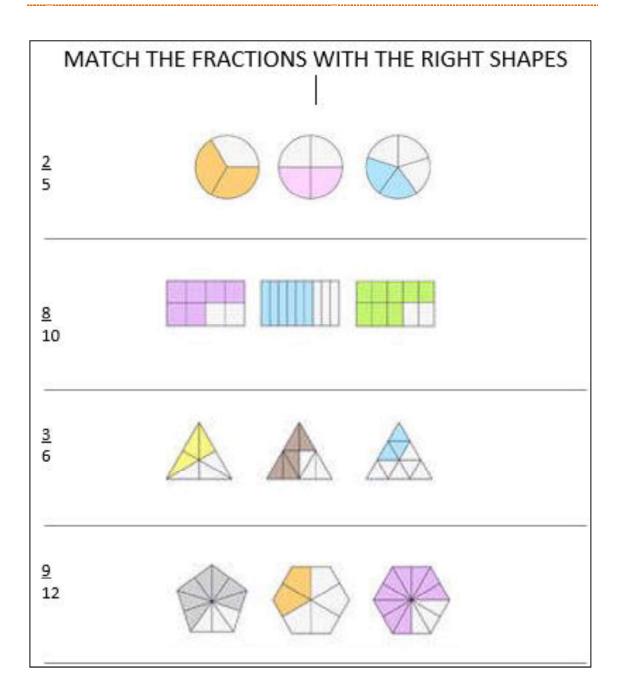
6.2.1 SHAPES - LESSON 2 - APPENDIX 1

SHAPES AND FRACTIONS. LOOK, READ, COLOUR THE FRACTIONS AND COMPLETE





6.2.2 SHAPES - LESSON 2 - APPENDIX 2





6.2.3 SHAPES - LESSON 2 - APPENDIX 3

COMPLETE THE DIAGRAM BY DRAWING SHAPES AND COLOUR THE RIGHT NUMBER.

Fractionix	Diagramsi
1 4	$\triangle \triangle \triangle \triangle_*$
2	
3	
5	The state of the s
6	
1	.≅ .
8	
3	- M
5	
1	
2 ,,	



6.2.4 SHAPES - LESSON 2 - APPENDIX 4

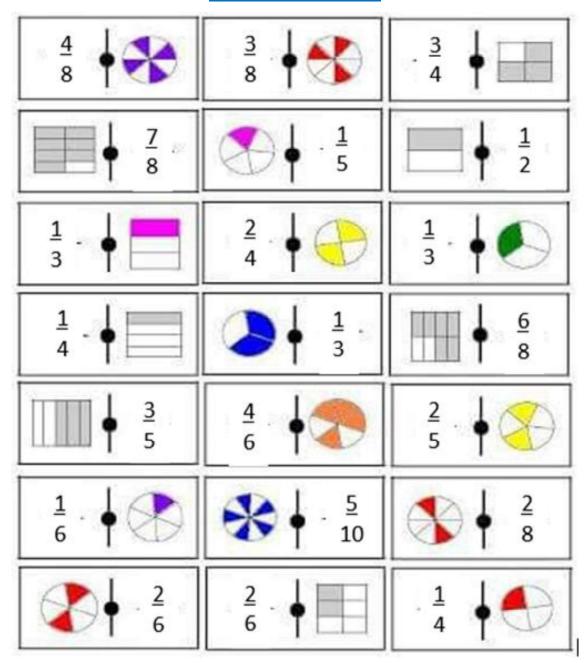
COMPLETE THE DIAGRAM BY DRAWING SHAPES. THEN COLOUR THE RIGHT NUMBER OF SHAPES ACCORDING TO THE FRACTION

FRACTION	DIAGRAM



6.2.5 SHAPES - LESSON 2 - APPENDIX 5

MATCH THE FRACTIONS WITH THEIR GRAPHIC RAPRESENTATIONS





6.2.6 SHAPES - LESSON 2 - APPENDIX 6

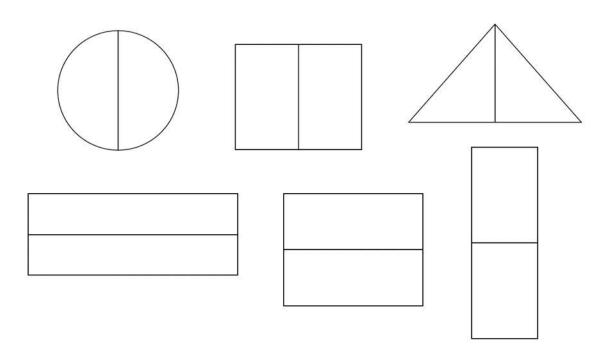
COLOUR ONE HALF (½) OF EACH OF THESE SHAPES

Remember!

Count the number of sections

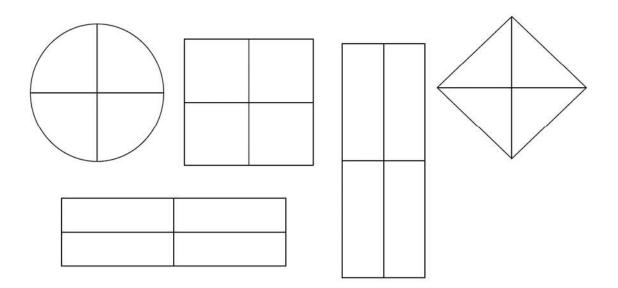
Divide by the bottom number

Multiply by the top number

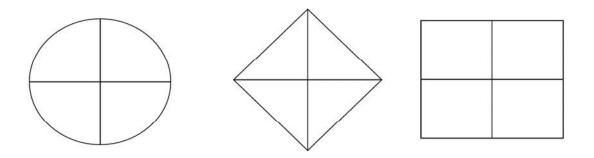




COLOUR ¼ (1 QUARTER) OF EACH OF THESE SHAPES

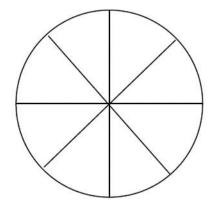


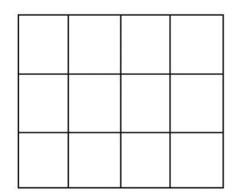
COLOUR ½ (1 HALF) OF EACH OF THESE SHAPES



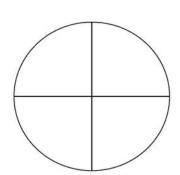


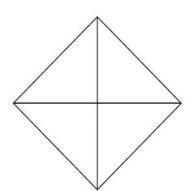
COLOUR ¼ (1 QUARTER) OF EACH OF THESE SHAPES

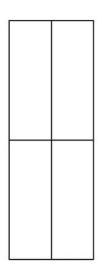




COLOUR ¾ (3 QUARTERS) OF EACH OF THESE SHAPES









		2	
	ļ		



6.3 Mathematics - Lesson 3: Let's Play! Let's Weigh!

Linguistic objective

<u>Vocabulary</u>: students know basic terminology connected with weight measurements (kilo/kilogram, gram, a kitchen scale, scale, weight, weigh; numbers 1 to 1000 and 1000 to 9000; right, wrong; heavy/ light/ tasty; fruit and vegetables words: potato, carrot, tomato etc./ apple, lemon, banana etc.)

<u>Structures</u> (one kilogram equals...How many grams? One thousand grams. How much does it weigh? 200 grams. Is it heavy or light? Four hundred grams plus one hundred grams equals...)

Linguistic objective

<u>Skills</u>: students understand information about converting grams into kilograms and kilograms into grams from authentic video (listening).

Students interact in order to play a game; students interact in order to compare measurements (speaking)

Linguistic objective

Functions: students use basic terminology connected with weight measurements.

Content objective

Students measure and experiment with a kitchen scale.

Students convert grams into kilograms

Communication

Students do tasks connected with measuring and compare the results

Students present and sing their own version of a song

Cognition

Comparing weights

Oral and rapid calculation

Conversion of weight measures





LEAD-IN: 10 MIN

GAME: Hot numbers

When introducing the game for the first time teacher shows the class a ball or a mascot and asks:

```
What is it?
```

After students' response, teacher makes sure that it's not a ball or a mascot, but a "hot number".

• Students stand up and make a circle.

T: Stand up, come here and make a circle. Let's count all together in tens from 10 to 100.

Let's pass the ball around in the circle and count again in tens. When you get the ball you say the next number.

Every child should say a number at least once.

- Next round children count in fifties from 50 to 1000.
- Next round children count in thousands from 1000 to 10000.



ACTIVITY 1: 15 MIN

• The teacher shows the students a kitchen scale and how it works.

```
T: This is a kitchen scale. Let's weigh John's pencil case. Look at the pointer. It says.....
```

- The teacher divides the class into a min. 3 groups. The teacher gives one kitchen scale to each group and one worksheet (*Appendix* 1) for each student.
- Each group weighs the items listed in the worksheet (*Appendix 1*: Weigh the school objects). E.g. all English course books of the group or all scissors of the group, etc.

T: Now each group weighs all the items in every category and completes the worksheet.



Students weigh the objects and write down the results.

• At the end the groups compare their results by answering the teacher's questions. In each group children take it in turns to answer.

T: Group A, tell me, how much do your scissors weigh? And group B, how much do your scissors weigh? And group C, how much do your scissors weigh? Are they heavy or light, compared to group A and B?



ACTIVITY 2: 20 MIN

- Students work in pairs/groups. Each pair/group gets one worksheet (*Appendix 2*). Students draw the pointers on the scales. Note that some scales weigh in grams and some weight in kilograms. The scale on each of the scales is different!
- Before distributing the worksheets, T does the first scale as an example on the board with the whole class.
- Teacher checks the answers with the whole class.



ACTIVITY 3: 20 MIN

• **Video:** Students watch a video and teacher stops the video whenever a conversion task appears and asks the students to give the results and write them down in their notebooks. E.g. At the minute 5.29 of the video, teacher says:

One thousand grams equals one kilogram. One kilogram equals...how many grams?

https://www.youtube.com/watch?v=ytZDeNei2vY







ACTIVITY 4: 25 MIN

• **GAME:** When introducing the game for the first time teacher forms groups of three, shows the class a set of cards (*Appendix 3*) and explains and demonstrates the game:

T: I'm going to give each group of three a set of cards, you put the cards in a pile in the middle of the table face down. Each of you takes a card from the top of the pile and puts it face up.

Now you think about the result of adding the two numbers of your card. E.g. 1 kg + 500 g = 1500 g: one kilo plus five hundred grams equals one thousand five hundred grams.

Each student gives his/her result out loud <u>in grams</u>. If two results in the group are the same, the pair is put aside. The odd one out card is returned to the pile. If there is no pair, all the cards are returned to the pile.

The winner is the group who first pairs all the cards.



Fast finishers. Students make 5-10 more pairs of cards, shuffle them and play again..

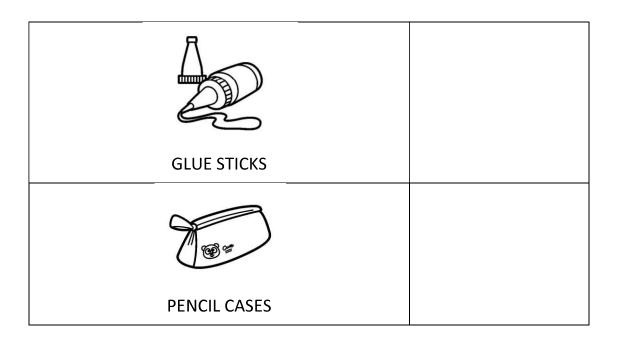


6.3.1 SHAPES - LESSON 3 - APPENDIX 1

WEIGH THE SCHOOL OBJECTS AND WRITE THE CORRECT WEIGHT

OBJECT	WEIGHT g
ENGLISH COURSE BOOKS	300 g
SCISSORS	
RUBBERS	
ENGLISH ACTIVITY BOOKS or NOTEBOOKS	







6.3.2 SHAPES - LESSON 3 - APPENDIX 2

Draw the Pointer

Name:	: Class:			
Draw the pointer on each of the following weighing scales.				
0 250 g	O 0 75 g	o kg 3		
190 grams	180 grams	4,200 grams		
0 9 300	l kg	0 250 •		
400 grams	4,400 grams	90 grams		
0 100 g	0 g 500	0 9 9		

copyright: www.mathinenglish.com

250 grams

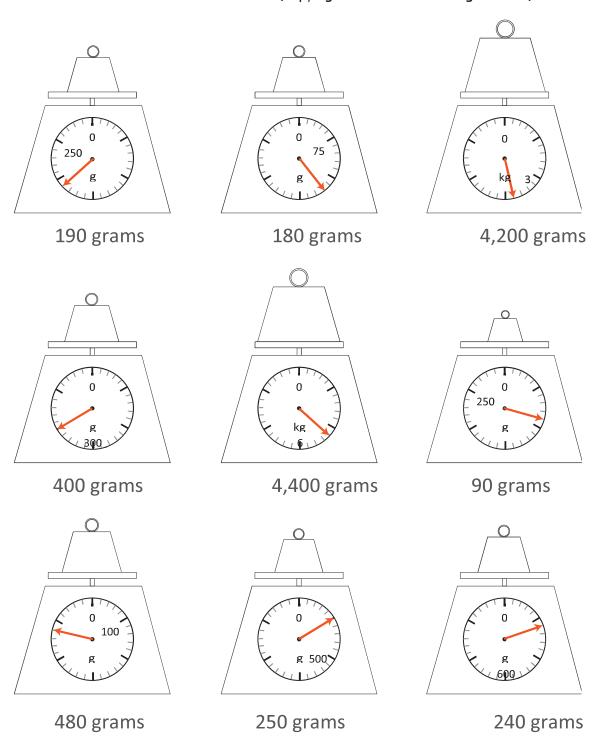
240 grams

480 grams





Answers (copyright: www.mathinenglish.com)



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Page 269 of 273



6.3.3 SHAPES - LESSON 3 - APPENDIX 3

400g	500g	0g	700g
100g	Og	1kg	300g
660g	850g	1400g	1800g
240g	50g	1400g	1000g



3kg	100g	200g	1100g
400g	3300g	1200g	300g

6000g	5kg	2300g	900g
500g	1500g	1600g	3kg



7kg	5400g	4200g	8000g
0g	1600g	4kg	200g

3700g	5000g	4500g	4kg
2300g	1000g	1800g	2300g



600g	1300g	2900g	8000g
1kg	300g	5100g	Okg

70g 770g 730g 30g