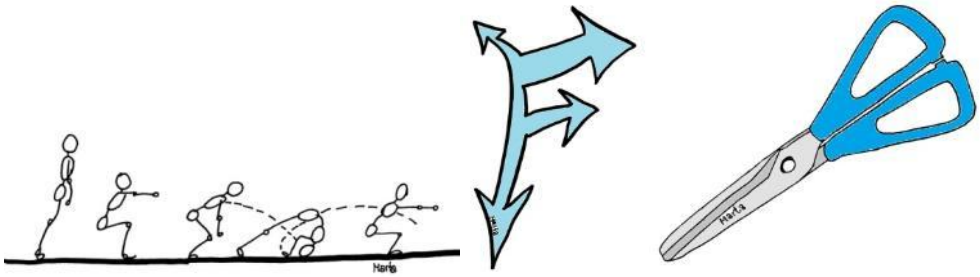
TEACHING NOTES

Unit1. Ready, steady, go!
Unit2. Forces in action
Unit3. Machines



MACHINES MOVE THE WORLD
CLIL unit

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UNIT1. READY, STEADY, GO!

LESSON1. MOVING OBJECTS

TEACHING/LEARNING ACTIVITIES

Warm up

Ask students if they think that there is motion in different images of the power point.

Think about the motion of different objects. Give them examples of how to draw the arrow to describe the motion in picture number 1.

Draw arrows in pictures of the worksheet 2 in front of or behind the object depending on its movement.

When all the groups finish, share the results. Ask seven students to draw the motion of the objects using the photocopies of the power point slides on the blackboard and check if the other groups have the same drawing.

Explain: '*The line or arrow to describe an objects' motion is called the TRAJECTORY'*.

Write the names of the motion of the different objects in the grid and why they think it is that kind of motion (w.3).

When all the groups finish, share the results. And ask:

'*What kind of motion is in number….? Why…?'*

'There is no coconut motion. It's a trick one.'

It is a…..motion because it describes a…..

It doesn't move.

Explain: *'Motion is a change in POSITION of an object with respect to TIME'*.

INTERACTION

In pairs
Whole group

RESOURCES

Power point (Slide 2)

Worksheet 2

Power point (Slides 3, 4, 5, 6, 7, 8, 9 and 10)

Worksheet 3

ANSWER KEY

1. It is **rectilinear motion**, because it describes a straight line.
2. It is **static,** because there is no motion.
3. It is **circular motion**, because it describes a circle.
4. It is **parabolic motion**, because it describes a parabola.
5. It is **rectilinear motion**, because it describes a straight line.
6. It is **oscillating motion**, because it describes an oscillation.
7. It is **elliptical motion**, because it describes an ellipse.
8. It is **elliptical motion**, because it describes an ellipse.

Recap of different kinds of motion

Complete the table about motion using the labels.

The teacher writes on the board the language students may need to agree or disagree.

Check the answers using slide 12 from the power point.

Students may complete the **self-assessment grid** at the end of the lesson 1.

INTERACTION
In pairs
Whole group

RESOURCES
Power point
(Slide 12)
Worksheets 4 and 5
Self-assessment grid lesson 1

ANSWER KEY

MOTION

RECTILINIAR MOTION	a straight line
OSCILLATING MOTION	an oscillation 
PARABOLIC MOTION	a parabola 
CIRCULAR MOTION	a circle 
ELLIPTICAL MOTION	an ellipse 

Motion is a change in position of an object with respect to time.

Trajectory is the line or arrow to describe an object's motion

LESSON2. WHY DO OBJECTS MOVE?

TEACHING/LEARNING ACTIVITIES

Recap

Review some vocabulary about the motion of the objects (rectilinear, circular…) and elicit some examples. Use the table about motion that we did in lesson1, activity 2.

INTERACTION
In pairs
Whole group

Hands on! Experiment with the velocity

Read the question of the experiment

How do you identify and **calculate** the **velocity** of objects/bodies?

Explain they are going to calculate the velocity of different objects using the formula below.

Velocity = **distance** from A to B in cm
Time in seconds

Each student has a table with the name of the objects and with the velocities to calculate.

Pupils in pairs may predict the velocity of the bodies looking at data. Write a number from 1 to 5 (from the fastest to the slowest).

Which will be the slowest object?

Which will be the fastest object?

Calculate the velocity and write a number from 1 to 5 (for the faster to the slower). Students can use a calculator.

Finally share and check the results with all the class.

Which is the slowest object?

Which is the fastest object?

RESOURCES
Power point (Slides from 13 to 17)
Worksheet 6
Pencil, a calculator, a chronometer and a tape measure

ANSWER KEY

Bodies in motion	PREDICTION	METERS	SECONDS	VELOCITY	The winner of a race
Skier		810 m	54s	15 m/s	3
Skateboard		25 m	50 s	0,5 m/s	5
Canyon ball		1500 m	15s	100 m/s	1
Bicycle		270 m	45s	6 m/s	4
Car		1280 m	32s	40 m/s	2

Hands on! Race

First choose 3 pupils from the class.

Student A is in charge of the order of the queue and says "Ready, steady, go!'

Student B is in charge of chronometer and says the time to student C.

Student C is in charge of writing the time of each student in the grid and at the end of the race making photocopies for each student.

Calculate the velocity of this real situation.

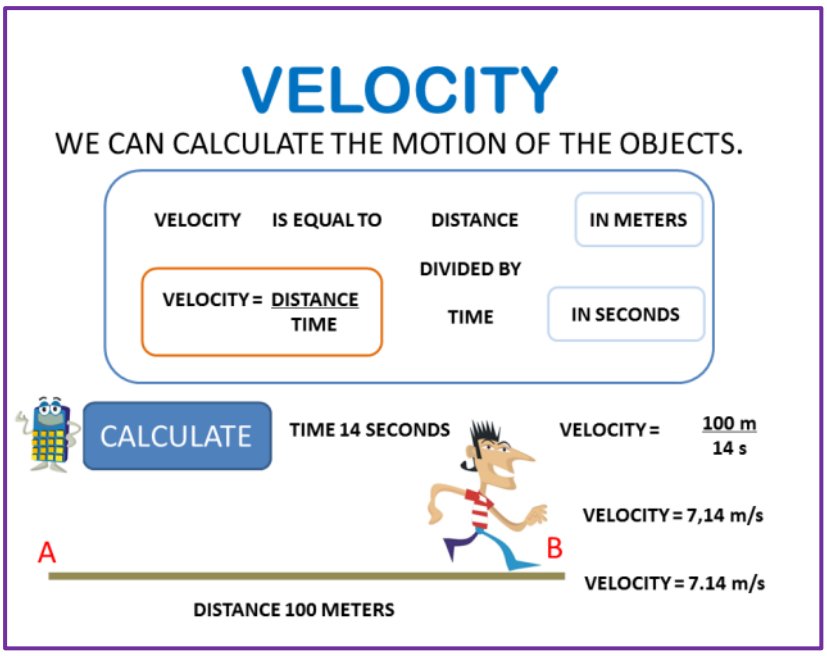
Students may complete the **self-assessment grid** at the end of the lesson 2.

INTERACTION
Whole group

RESOURCES
Worksheet 7
Pencil, a calculator, a chronometer and a tape measure
Self-assessment grid lesson 2

LANGUAGE SUPPORT

I think that	skier skateboard canyon ball bicycle car	will be	the first/second/…. the last. the fastest. the slowest.
The		is	
I don't think so.			
I agree with……			



UNIT2. FORCES IN ACTION

LESSON3. UNBALANCED AND BALANCED FORCES

TEACHING/LEARNING ACTIVITIES

Newton's first law of motion: INERTIA

Explain:

*'An object at **rest** stays at **rest,***

*an object in **motion** stays in **motion'.***

Explain the first and the second part of Newton's Law using an object e.g. a pencil. Then ask pupils:

Why does the object stop moving?

Why does the object change its direction?

*Because it is the result of an **UNBALANCED FORCE** applied upon an object*.

Access to the links to know more things about motion and Newton's first law of motion.

- Watch the video INERTIA (YouTube) which is about Newton's first law.
- Access to the website about Newton's 'Laws of motion'. This is a good resource because the video is interactive.

Balanced and unbalanced forces

Explain to students that they are going to work with the concept of forces.

Show an interactive video about all the forces that we are going to talk about; we use this video to introduce all the forces. Bitesize- science

This video is interactive so you may ask 4 different students to press buttons or arrows of the video during the activity.

Balanced forces: watch the video of the effect of balanced forces on objects. If you have enough time they could do the experiment.

Give a worksheet (w.2) to each student and ask two of them to read the activity that they are going to do.

Check understanding.

Complete a word search with the words that we are going to work with in the lesson and with the definition of force.

Students may complete the **self-assessment grid** at the end of the lesson 3.

INTERACTION
In pairs
Whole group

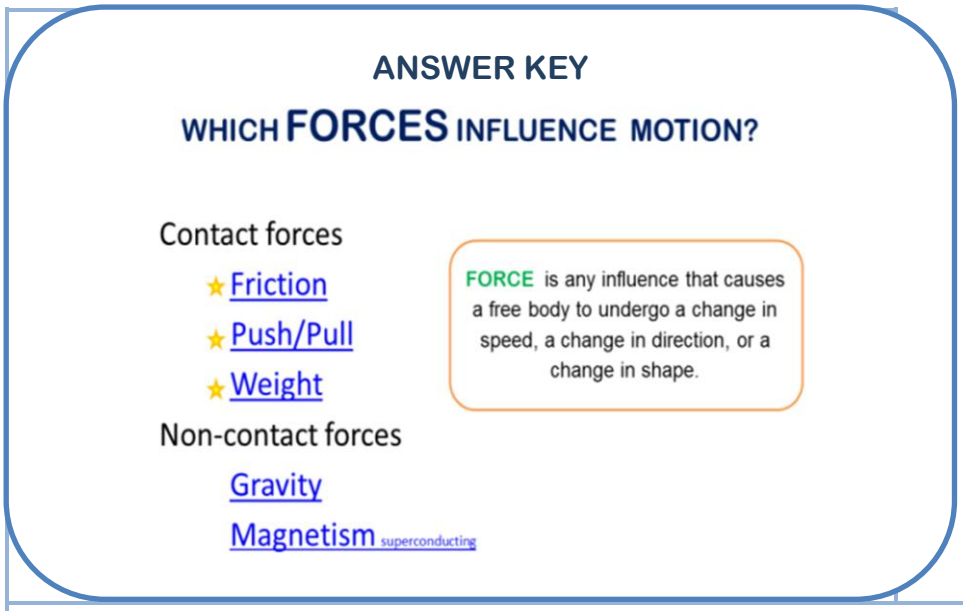
RESOURCES

Power point (Slide 2)
Access to internet and computers
Power point (Slides 3, 4 and 5)
Worksheet 2

Note: 1kg is 9.8 newtons but in the video it says that 1Kg is 10 newtons.

Point this out to the pupils to avoid confusion.

RESOURCES
Self-assessment grid lesson 3



WEB RESOURCES

Newton's Laws of motion. There are interactive resources for the three laws.
http://science.discovery.com/interactives/literacy/newton/newton.html

Video 'Eureka!' from YouTube to explain INERTIA, first Newton's law of motion (4'50'')
http://www.youtube.com/watch?v=by-7kkAu2Pg

Video of the experiment about balanced forces.
http://www.youtube.com/watch?v=S6h_fDd-Hkc&feature=player_embedded

Interactive activity online on forces and measure of forces.
http://www.bbc.co.uk/schools/ks3bitesize/science/energy_electricity_forces/forces/activity.shtml

LESSON4. FRICTION, WEIGHT AND MASS

TEACHING/LEARNING ACTIVITIES

Hands on! Experiment with friction

Explain what the experiment is about:

*How do **different surfaces** affect the **movement** of the objects?*

Explain that they have different roles in the group:

Student A is in charge of the objects, preparing the conditions for the ramp and dropping the toy car.

Student B is in charge of the metric tape. He/she says the distance to student A.

Student C is in charge of writing the distance in the results table.

Students follow the instructions on the worksheet. First, they predict the distance of the toy car on each surface and then

INTERACTION
Groups of 3
Whole group

Theory:

'**Friction** is the force of rubbing the relative motion of solid surfaces'.

do the experiment and share their predictions with the class.

I/we think that the distance will be /the same/different in the three surfaces.

Then each group creates a ramp using 4 clothespegs and plastic cable covers. They must drop the toy car and measure the distance; do 3 different trials for each surface and calculate the total distance with a calculator.

The farthest surface is….

The slowest surface is…

Share the results and answer the questions:

Remember: What kind of motion is it? Why?

Rectilinear motion, because it describes a straight line.

On which surface is the distance the shortest?

On which surface is the distance the farthest?

Why does the same object have a different distance?

Because the surface is different.

Because of the effect of the friction/

and friction is a force of the surfaces.

RESOURCES

Worksheet 3

Pencil, toy car, metric tape, clothespegs, tape, scissors, aluminium foil, wax paper, recycled paper, sand paper, a calculator and plastic cable covers. (One for group)

Power point (Slides 10, 11)

ANSWER KEY

Example of some possible results

SURFACE	PREDICTION cm	TRIAL 1 cm	TRIAL 2 cm	TRIAL 3 cm	DISTANCE $\frac{T1+T2+T3}{3}$
Aluminium foil	**1**				**100 cm**
Wax paper	**2**				**80 cm**
Recycled paper	**3**				**40 cm**
Sand paper	**4**				**10 cm**

Conclusion: Aluminium foil has less friction than sand paper.

Difference between mass and weight

Explain:

On Earth our mass is equal to our weight.

Ask students:

What will happen with our weight if we travel around space?

I think that we will have the same weight.

I think that we will have a different weight.

RESOURCES

Power point (Slides 12 and 13)

Internet/ A computer

Self-assessment grid lesson 4

Tell students that they are going to calculate their weight in different planets, on the Sun and on the Moon.

Watch the video about mass and weight to understand the differences between these two concepts.

Students may complete the **self-assessment grid** at the end of the lesson 4.

WEB RESOURCES

If we want to reinforce the concept of friction there are two videos of 1 minute each 'Wheels meets friction' and 'slippery ice'.
http://www.edu365.cat/eso/muds/ciencies/minut_de_ciencia/index.htm?lang=en#
http://www.edu3.cat/Edu3tv/Fitxa?p_id=28528&p_ex=science%20please

ICT activity to reinforce the concept of friction and different surfaces.
http://www.bbc.co.uk/schools/ks2bitesize/science/physical_processes/friction/play.shtml

Video about mass and weight
http://www.youtube.com/watch?v=G5Fyw2z5HM8

LESSON5. THE POWER FOR MOVING THINGS

TEACHING/LEARNING ACTIVITIES

Calculating weight

Explain:

***MASS**: is a measurement of how much **matter** is in an object.*

***WEIGHT:**:is a measurement of how hard **gravity is pulling** on that object.*

Ask pupils: *'What will happen with our weight if we travel around space?'*

KEY: *Our MASS is the same everywhere but if we travel over the universe we have a different WEIGHT*

Students may calculate their weight in different parts of the solar system. They can use the grid to do it (w.4).

Gravity multiplied by mass is equal to weight
Or
WEIGHT = mass x gravity

Talk with their partner about the results that they get on the table and answer two questions.

Is your weight different or is it equal?
Is your mass different or is it equal?

INTERACTION
Individual
In pairs
Whole group

RESOURCES
Worksheet 4
Power point (Slides 5 and 10)
Power point (Slide 11)
Power point (Slide 12)
Calculator
Power point (Slide 13)

Students may calculate their weight in Newtons using the table. Remind students that weight is a force that should be calculated in Newtons.

1 Kg = 9,8 Newtons

ANSWER KEY

Is it your weight different or is it equal?

My weight ~~never changes.~~ changes.

Is it your mass different or is it equal?

My mass ~~never changes.~~ changes.

Remember in some UK or US videos We can find **1kg = 10 Newtons**

Push and pull

Explain that a force can be a push or a pull (w.5, w.6).

Classify pictures about pushes or pulls. There are two images (yo-yo and toy horse) that are both, push and pull.

Ask:

'Why do you think it is a push/pull?'

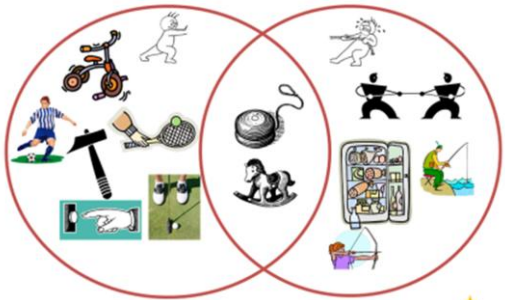
_____*is a push because it is a force that can move something **away from** somebody/something.*

_____*is a pull because it is a force that can move something **towards from** somebody/something.*

To check the results use the power point slide.

ANSWER KEY

Is it a push or a pull?



ITC. Activity on BBC website to recap concepts about push and pull. There is an icon for the audio activity. If they click on it they can listen to the question and the vocabulary.

INTERACTION

In pairs
Whole group

RESOURCES

Power point (Slides 5, 14 and 15)
Scissors
Worksheets 5 and 6
Power point (Slide 15)
Computers
Power point (Slide 16)
Self-assessment grid lesson 5

Newton's Second Law of Motion

Explain the second law of motion to introduce the idea of calculating forces in Newtons.

Ask 4 students to click on the arrows during the interactive video and check the understanding.

Students may complete the **self-assessment grid** at the end of the lesson 5.

WEB RESOURCES

You can start the activity on the smartboart and show how to use the interactive activity about push and pull force.
http://www.bbc.co.uk/schools/scienceclips/ages/5_6/pushes_pulls.shtml
Newton's Second Law
http://science.discovery.com/interactives/literacy/newton/newton.html

LESSON6. THE POWER FOR MOVING THINGS

TEACHING/LEARNING ACTIVITIES

Hands on! Using a dynamometer

Explain that they are going to analyse the relationship between the mass and the force needed to move that mass using a dynamometer.

How do you use a dynamometer?
What is the relationship between mass and force?

Student A is in charge of the objects, preparing the conditions to know the mass and attaching it on the dynamometer.

Student B is in charge of reading the results on the tape measure and on the dynamometer.

Student C is in charge of writing the results of measuring the mass of the objects and of the dynamometer on the data table.

The steps for the experiment, are:

1. Predict the power of the force needed to move those objects. Write a number from 1 to 3 (from the biggest force to the smallest force).

2. Measure the objects with a weighing scale and record it in your data table.

3. Put a tape measure on the floor and measure 100 cm in straight line.

4. Attach the object to the dynamometer and pull it along a distance of 100 cm and record the result in your data table.

5. Write your conclusion about the experiment.

INTERACTION
In groups of 3
Whole group

RESOURCES
Power point (Slides 17, 18, 19 and 20)
Worksheet 7
Dynamometer, tape measure, weighing scale, a pencil and 3 objects

6. Share and check the results with all the class.

ANSWER KEY

Example of the results, but you can choose different objects.

Objects	PREDICTION	MASS	FORCE NEWTONS	Result
Dictionary				1
Apple				3
Bottle of water				2

If the mass of an object is **bigger** the force needed to move it is **bigger.**
If the mass of an object is **smaller** the force needed to move it is **smaller**

I think that	object 1	will need	more	force than object__to be moved.
The	object 2 object 3	needs	less	
I don't think so. / I/we think that….				
We/I agree with……				

Language for the conclusions

If the mass of an object is	bigger smaller	the force needed to move it is	bigger smaller

Forces: jigsaw

Match questions with answers about forces that they did during the lessons (3, 4, 5 and 6) in order to recap the concepts (w.8). They have a picture to help them understand. You can print out a copy and post it in to the classroom.

Complete 8 sentences about motion and then they must match the definition with the name of the force or a concept.

Explain the **rules of the game** (w.10): **Running dictation**

Student **A** must read the sentence, memorize it and tell it to their partner (student **B**) who must write it on a worksheet.

When the sentence is completed students **A** and **B** must change the roles: one reads, memorizes and tells and the other student writes.

It's your turn/ it's my turn.

Listen to me/ I'll repeat…

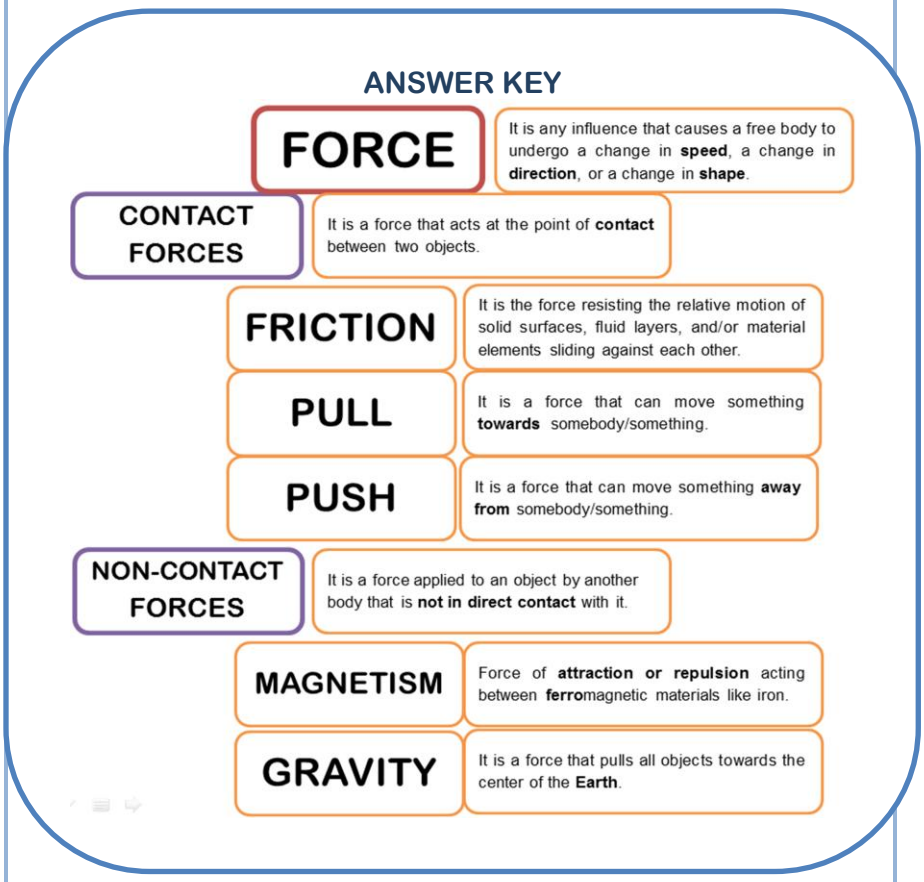
Can you repeat, please?

INTERACTION
In pairs
Whole group

RESOURCES
Power point (Slide 22)
Worksheet 8
Scissors
Worksheets 9, 10
Use the worksheet 9 as a table to complete the exercise.

When all the sentences are completed they must match the definition with the names. Students may cut out the labels and stick them in worksheet 9.

Finally use the power point to check the results.



Newton's Third law of motion: ACTION AND REACTION

Explain the Third law of motion to introduce the idea that for every action there is an equal and opposite reaction.

Ask 4 students to click on the arrows during the interactive video.

Watch the video about action and reaction forces.

Students may complete the **self-assessment grid** at the end of the lesson 6.

RESOURCES

Power point (Slide 21)
Internet and computer
Self-assessment grid lesson 6

WEB RESOURCES

Newton's third Law
http://science.discovery.com/interactives/literacy/newton/newton.html
Action and reaction forces.
http://www.edu3.cat/Edu3tv/Fitxa?p_id=28530&p_ex=lift%20off&p_num=3

UNIT3. MACHINES

LESSON7. A SIMPLE MACHINE: THE LEVER.

TEACHING/LEARNING ACTIVITIES

Is this a machine?

Give each group a bag/box with all the pictures (w.3)

Classify the pictures in two groups: machines and non-machines.

Write in the betting game grid their bet for each picture (w.2).

When all the groups finish, share the results and **correct only** (apple, book, artichoke and dog) the non-machines classification.

Ask them:

Is a/an … a machine?
Yes, it is/ No, it isn't.
I agree with you.
I don't agree with you.

'Why do you think that…. is a machine?'
'Why do you think that … isn't a machine?'

We / I think that	a dog an axe …	Is / isn't a machine because	it doesn't use electricity. it is an animal/vegetable. I have it in the kitchen

My/our bet is	1, 2, 3, 4 or 5	points for	yes no

First, second, third, fourth, fifth, sixth and seventh.
/the last one/the first one/before /after

Each group may summarise the results of loss and gain column and decide the winner of the betting game depending on the results of grand total.

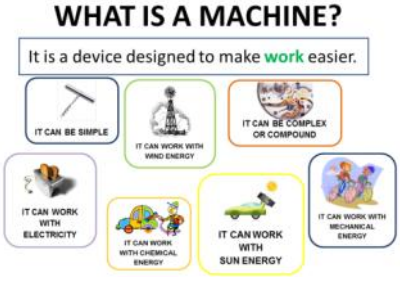
W.5 Write three machines that they usually use. They must write the energy that this machine uses to work looking at the pictures they have on the worksheet and what is the purpose to use each machine.

KEY: *A cork screw uses mechanical energy to open bottles.*

Match the questions to the answers about what energy is.

INTERACTION
In pairs
Whole group

RESOURCES
Power point (Slides 2, 3)
Worksheets 2, 3
Pictures of simple machines, compound machines and non-machines
Power point (Slides, 4, 5, 6)
Worksheet 5



Hands on! lever

Ask some questions while looking at the power point.

Show the power point of the Bob activity to introduce the specific vocabulary.

Solve this question below by doing the experiment.

Can we do the same work with less effort?

Before starting the experiment they must match the answers with the questions about it.

When they finish, check the results on the power point slide.

ANSWER KEY

How many rulers do we need?	We need two rulers: one long and one short.
What do we do with the rubber?	We use the rubber as a fulcrum for doing a lever.
What is the big book for?	We use the big book as a load.
Which ruler do we use first?	Start with the short ruler and then do the same process with the long ruler.
What are the small books for?	We use the small books as an effort.
What is the ruler for?	We use the ruler as a lever.

Write a list of materials for the experiment looking at the answers and at the questions of the worksheet 6.

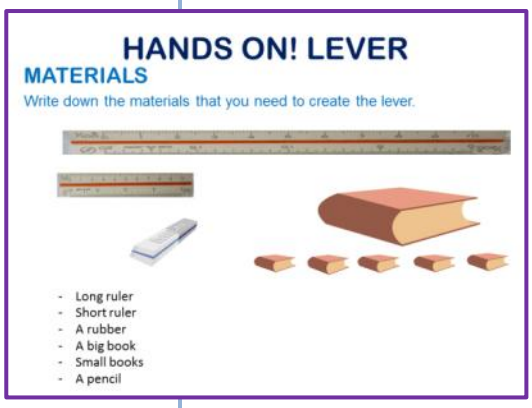
Cut the sentences from worksheet 6 and order the steps of the experiment (w.7).

Then check the results with the power point slide.

HANDS ON! LEVER

STEPS

1. Predict: What is the **best position** of the rubber (as a fulcrum) to lift the big book with less effort (less small books)?
   Predict: Which is the **best ruler** for lift the big book with less effort?
2. Prepare all the materials.
3. Start with the short ruler.
4. Try different positions for the rubber (fulcrum).
5. What is the best position of the rubber (as a fulcrum) to lift the big book with less effort (less small books)?
6. Change the short ruler for the long ruler and repeat the process.
7. What is the best ruler to lift the big book with less effort?



Students may complete the **self-assessment grid** at the end of the lesson 7.

INTERACTION

In pairs
Whole group

RESOURCES

Power point (Slides 7, 8, 9,10,11,12 and 13)
Worksheet 6
Power point (Slide 15)
Worksheet 7
Power point (Slide 16)
Self-assessment grid lesson 7

LESSON8. FIND LEVERS.

TEACHING/LEARNING ACTIVITIES

HANDS ON! Doing the experiment

Follow the steps of the experiment that they did in lesson 6.

First, students must make two predictions (w.8):

*Predict: What is the **best position** of the rubber (as a fulcrum) to lift the big book with less effort (less small books)?*

*Predict: What is the **best ruler** to lift the big book with less effort?*

Then:

Prepare all the materials.

Start with the short ruler.

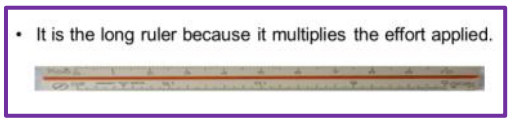
Try different positions for the rubber (fulcrum).

Use the dynamometer to know the effort applied in each case.

Answer these questions by doing (w.8):

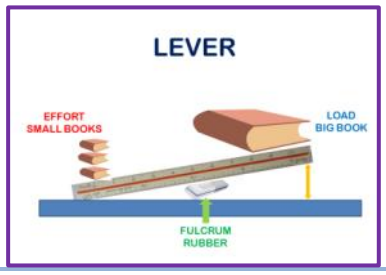
What is the best position of the rubber (as a fulcrum) to lift the big book with less effort (less small books)?

What is the best ruler for lift the big book with less effort?



First, second, third, fourth, fifth, sixth and seventh/ the last one/the first one /before /after

Finally draw the lever and write the names in the correct position (big book, small books, ruler, rubber, load, effort and fulcrum) and check the results.



INTERACTION
In pairs
Whole group

RESOURCES
Power point (Slide 16)
Worksheets 6, 7 and 8
Rubber, short ruler, long ruler, big book and small books
Dynamometer

"Give me a lever long enough; a fulcrum strong enough and I'll move the world."
Archimedes

Explain what a lever is and that there are different classes of levers.

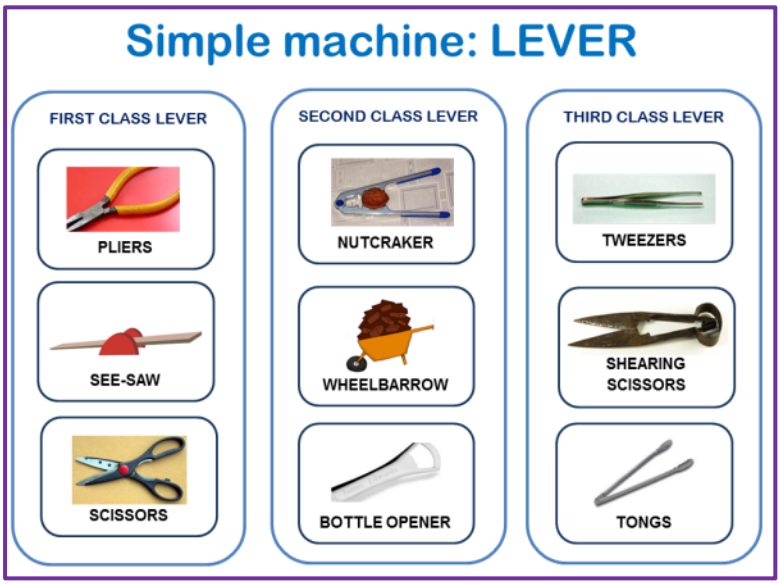
Find on different kind of levers (w.9, w.10):

FULCRUM: **green** dot

EFFORT: **red** arrow

LOAD: blue arrow/dot

Finally cut out the pictures and place all of them in the correct column depending on the class of the lever. Check the results.



Students may complete the **self-assessment grid** at the end of the lesson 8.

RESOURCES

Power point (Slides 17, 18, 19, 20 and 21)
Power point (Slides 22, 23 and 24)
Worksheets 9, 10
Power point (Slide 25)

Self-assessment grid lesson 8

For the w.9, w.10 they can use stickers (arrows and dots).

LESSON9. DISCOVER THE SIMPLE MACHINES.

TEACHING/LEARNING ACTIVITIES

Fill the gaps

Give each pair of students' two different worksheets: one is for student **A** (w.11), and the other is for student **B** (w.12).

Student **A** asks his/her partner questions to find the missing information and writes it on his/her worksheet.

Finally student **B** is who asks the missing information and writes the answers.

Identify the effort done

Draw an arrow in the pictures depending on the direction of the effort (w.13, w.14).

Classify these pictures according to the information about simple machines.

INTERACTION
In pairs
Whole group

RESOURCES

Power point (Slides 26, 27, 28, 29, 30 and 31)
Worksheets 11, 12, 13 and 14

Classify simple machines

Compose a poster about simple machines (w.15, w.16).

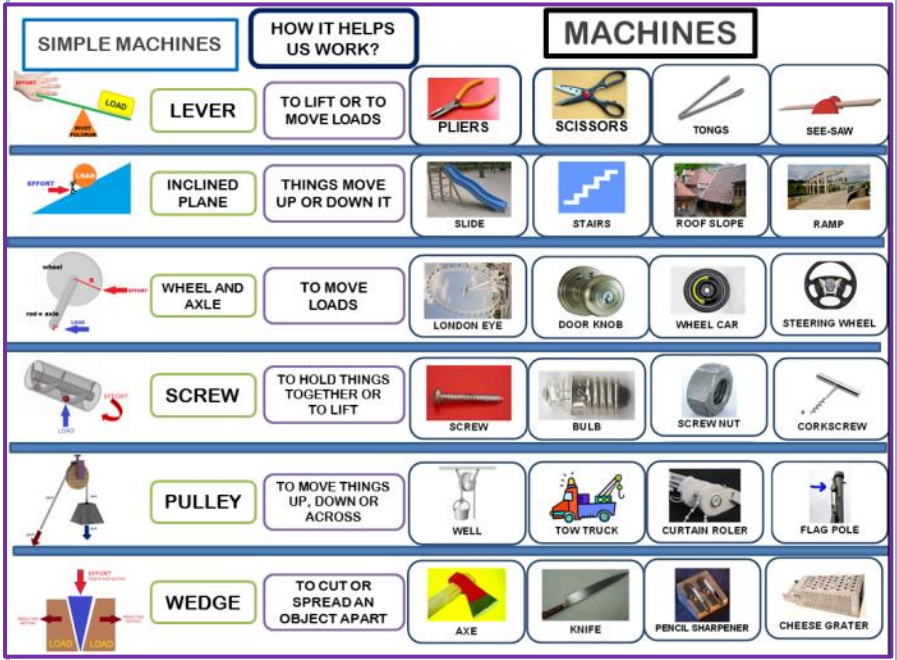
Put three rows:

- Simple machine
- How it helps us work?
- Machines

In the last row put the machines from the worksheets 13 and 14.

Ask them:

How does / lever / inclined plane / screw/.../ help us work?



Classify the pictures of the betting game in two groups: compound machines and simple machines (w.4)

Why is this object a simple/compound machine?

It is a simple machine because it only has...

It is a compound machine because it has 2, 3, 4... simple machines.

Analyse machines

Ask pupils:

What simple machines can you identify in the objects below?

Write the names of the simple machines (w.16). They can use the poster of simple machines to help them.

Note: In this worksheet you can find a gear. It could be considered as a compound machine itself because it is a

RESOURCES

Power point (Slide 32)
Worksheet 15
Power point (Slide 33)
Worksheet 4
Worksheet 16
Computer
Internet access

Theory:
Simple machines are: a lever, an inclined plane, screw, wheel and axle, a pulley and a wedge.
A compound machine is any combination of simple machines.

combination of two wheels.

Propose pupils an ITC activity about the simple machines that they can find in different parts of the house. At the end of each exercise you can print the results of it.

Students may complete the **self-assessment grid** at the end of the lesson 9.

RESOURCES

Self-assessment grid lesson 9

WEB RESOURCES

Activity online with simple machines.
http://edheads.org/activities/simple-machines/frame_loader.htm

LESSON10. DISCOBER COMPOUND MACHINES

TEACHING/LEARNING ACTIVITIES

Let's find machines in our school

Complete a table (w.17):

- With the name of the machine that they think is a machine.
- With the use of this machine.
- With the name of the simple machine that they can identify.

What machines have you found?

We have found a/an….

What is its use?

We can use a/an ….. to….

What simple machines (e.g. scissors) has?

It has……./ …….(scissors) has….(two wedges and two levers)

Propose pupils an ITC activity about simple machines and forces. It is an activity where they must remember the forces that they have studied in the unit before. At the end of each exercise you can print the results of it.

An example of a compound machine

Analyse the picture of the '*simple lawn-sprinkler*' (w.18) and say as many words and verbs that they can.

Compose a text of the process of the machine using the labels provided on worksheet 19. Cut out the labels. Look at the picture. Order the text and put a letter inside the brackets.

Then check the order of the process with the whole group.

INTERACTION

Individual
In pairs
Whole group

RESOURCES

Power point (Slide 34)
Worksheet 17
Computers
Internet access
Worksheets 18 and 19
Scissors
Power point (Slides 35 and 36)
Self-assessment grid lesson 10

OUR SIMPLE LAWN-SPRINKLER

A ROCKING CHAIR (A) SQUEEZES A BULB (B) SPRAYING A SHIRT (C)

THIS CAUSES IT TO SHRINK AND PULL THE STRING(D) TIPPING THE SHELF (E)

THE HOMEMADE BISCUIT (F) FALLS HEAVILY INTO THE NET (G)

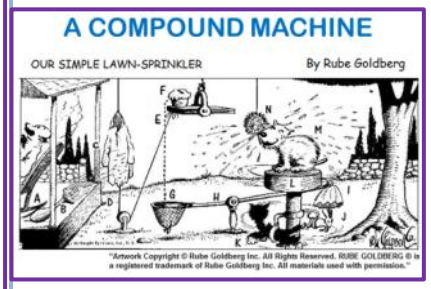
CAUSING THE ROD (H) TO RAISE A COVER (I)

EXPOSING A MOUSE (J) A CAT CHASES THE MOUSE (K)

THEREBY REVOLVING THE PLATFORM (L) EACH TIME THE LAUGHING HYENA (M)

REVOLVES HE IS TICKED ON THE NOSE BY FEATHER BALL (N)

CAUSING HIM TO LAUGH SO HARD HE CRIES - THE SPEED OF THE REVOLUTIONS SCATTERS TEARS OVER LAWN CAUSING THE GRASS TO GROW.



Students may complete the **self-assessment grid** at the end of the lesson 10.

WEB RESOURCES

Activity online with simple machines and forces.
http://www.edheads.org/activities/odd_machine/frame_loader.htm

LESSON11. YOUR COMPOUND MACHINE

TEACHING/LEARNING ACTIVITIES

Warm up: take a look at other projects

Show pupils videos of compound machines and how they work. They can see:

- Pupils showing different machines.
- Different materials used to build machines.
- "Pythagoras switch" which is a Japanese video about machines.
- Compound machines in Advertisements.

Organizing steps of the process

Ask pupils to order the steps of the process to build a compound machine (w.20).

The first step is…/the second step is…/

Our next step is to…

Then check the order of the process with whole group. This order will be the checklist for organizing the steps of the process (w.21).

INTERACTION
In groups of 3
Whole group

RESOURCES
Power point (Slide 37)
Worksheet 20
Power point (Slide 38)
Worksheet 21
Self-assessment grid lesson 11

Start the project

Explain to pupils the phases of the process to build a machine.

Students may complete the **self-assessment grid** at the end of the lesson 11.

WEB RESOURCES

Some school projects there are different pupils and different machines with different purpose.
http://www.youtube.com/watch?v=e5OG65Aaisc&NR=1
Different materials to use for building a machine.
http://www.youtube.com/watch?v=SG1U_HPotKE&feature=related
'Pythagoras switch'
http://www.youtube.com/watch?v=K2C-PWHpPoI
Compound machines in advertisements

http://www.youtube.com/watch?v=_ve4M4UsJQo&feature=related

LESSON12. THE INVENTOR OF THE YEAR: PHASE 1

TEACHING/LEARNING ACTIVITIES

Planning the process

Steps 1, 2, 3 and 4 of the checklist (w.21).

Brainstorm. Big ideas about their machine.

*'You have 20 minutes to think about your idea / machine /theory and **you can do it in Catalan'**.*

Students must think about what language they are going to need to build a machine (w.22, w.23).

E.g. *You should put this piece … there/ up / down.*

Can you help me, please?

It doesn't work.

Try again.

Change the position of…

Take it off.

Write out this language and place it in the classroom where everybody can see it.

Ask them to use it as much as possible because the teacher will record how much English they use. They get a mark if they use English and it will be in the final report.

Students may complete the **self-assessment grid** at the end of the lesson 12.

INTERACTION
In groups of 3
Whole group

RESOURCES
Worksheets 21, 22 and 23
Self-assessment grid lesson 12

Use the **checklist** to follow the process.

LESSON13. THE INVENTOR OF THE YEAR: PHASE 2

TEACHING/LEARNING ACTIVITIES

Planning the process

Steps 5, 6, 7 and 8 of the checklist (w.21).

There are 3 different tasks in each group (w.23, w.24).

CONSTRUCTOR (the maker) is in charge of organizing the construction of the machine with the help of his /her two partners.

OBSERVER is in charge of telling his /her partners that they should speak in English. At the end of the process is in charge of demonstrating and explaining to other groups their machine.

REPORT WRITER is in charge of writing the lists, ordering the stages of the process and then writing these steps.

They may use more English in this phase because they have the language support in the classroom.

Students may complete the **self-assessment grid** at the end of the lesson 13.

INTERACTION
In groups of 3
Whole group

RESOURCES
Worksheets 21, 23 and 24
Self-assessment grid lesson 13

Use the **checklist** to follow the process.

LESSON14. THE INVENTOR OF THE YEAR: PHASE 3

TEACHING/LEARNING ACTIVITIES

Create an exhibition

Steps 9 and 10 of the checklist (w.21).

They should use their writing of the phase 2 to explain how the machine works.

This last phase is totally in English (w.24, w.25).

They will have an award of the inventor of the year depending on the results of the group-assessment sheet, the self-assessment register and the teacher report.

Students may complete the **self-assessment grid** at the end of the lesson 14.

INTERACTION
In groups of 3
Whole group

RESOURCES
Worksheets 21, 24 and 25
Self-assessment grid lesson 14

Use the **checklist** to follow the process.

SCAFFOLDING TIPS

LANGUAGE FOR THE TEACHER	LANGUAGE FOR THE LEARNER
Wait a moment. Listen to me. Listen to him / her. Answer the question. Put your hand up. Work in pairs, please. Pay attention. Read out loud, please. Read it silently. Look at..... Let's check!	Can you repeat it please? Can you help me, please? I/we think that…. We/I agree/disagree with … I don't understand. What does ..... mean? How do you say ..... in English? How do you spell.....?

INSTRUMENTS FOR ASSESSMENT

Speak with the teacher/partner.
Ask students: 'What are you going to do?' to check if they understand the activity.
Complete the self-assessment sheet.
Teacher's report will consider:

- The self-assessment sheets of the lessons.
- The process of creating a machine.
- The final compound machine.
- The English they use in the classroom. In every lesson teacher register the times that they use English in a document in the classroom.

"Discovery consists of seeing what everybody has seen and thinking what nobody has thought"

Albert Szent-Györgi