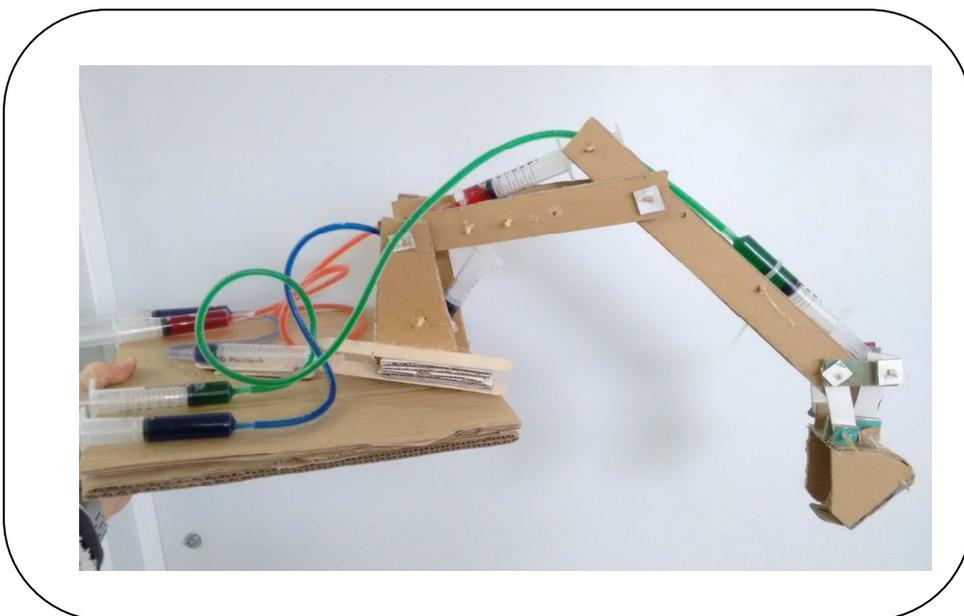


TÍTOL

Fluid Power

Àrea: Tecnologia

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GRUP D'EXPERIMENTACIÓ PER AL PLURILINGÜISME



Generalitat de Catalunya
Departament d'Ensenyament



Fluid Power

Material elaborat durant la realització de la formació adreçada als docents que implementen el pilotatge del GEP (Grup d'Experimentació per al Plurilingüisme) durant el curs 2015-2016, realitzada amb el/la formador/a del International House Barcelona

SG de Llengua i Plurilingüisme
Servei de Llengües Estrangeres

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Ten tips for learning success

- ❖ Relate information and ideas to real life situations.
- ❖ Work individually and collaboratively, in pairs and in group.
- ❖ Explore a variety of multimodal and authentic materials.
- ❖ Carry out activities that are challenging and require thinking.
- ❖ Use graphic organizers to structure ideas and texts.
- ❖ Use appropriate language to explain information to others (orally and in writing)
- ❖ Take greater responsibility for learning by assessing own and peer's work.
- ❖ Work in safe learning environments.
- ❖ Ask questions in order to understand concepts.
- ❖ Try to use English as much as possible.

Títol del text

Look at the video linked and answer the questions.

Shaking it up with fluid power:

<https://www.youtube.com/watch?v=rFrcCEDsNBg>

(showing subtitles)

Activities

Explicit

- What examples of uses for fluid power are shown in the video?
- What do fluid power systems in these examples generate?

Implicit

- Which is the purpose of these examples?
- Are the examples simple applications of fluid power?

Referential

- Do you think these uses of fluid power are interesting?
- What other ways can you imagine to achieve similar results?

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Revision

Match the image and the word:



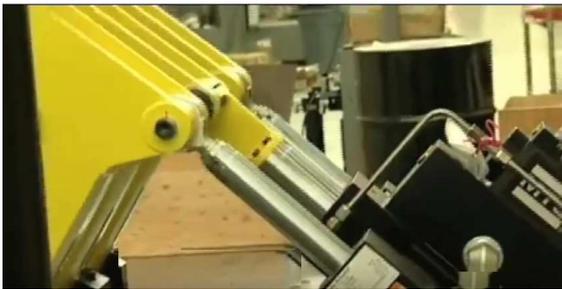
ram



building



pothole

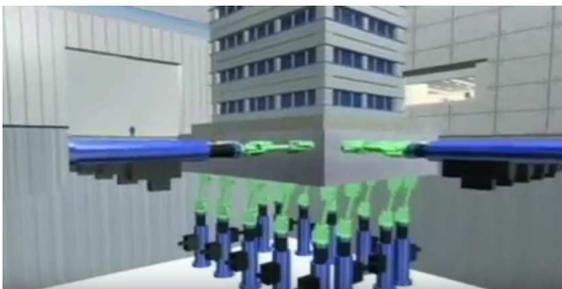


Draw with arrows the possible movement of the rams.



What is the objective of the hydraulic machine of the image?

- Test the suspension system of the car.
- Fix the wheel.
- Repair suspension system of the car.



What is the system in the image doing?

- Pushing the building.
- Pulling the building.
- Holding the building.

Extension

Hydraulics in practice

You can see hydraulics at work in this digger. When the driver pulls a handle, the digger's engine [pumps](#) fluid into the narrow pipes and cables (shown in blue), forcing the hydraulic rams (shown in red) to extend. The rams look a bit like bicycle pumps working in reverse. If you put several rams together, you can make a digger's arm extend and move much like a person's—only with far greater force. The hydraulic rams are effectively the digger's muscles:



Photo: There are several different hydraulic rams at work in this digger. The rams are shown by red arrows and the narrow, flexible hydraulic pipes and cables that feed them in blue.

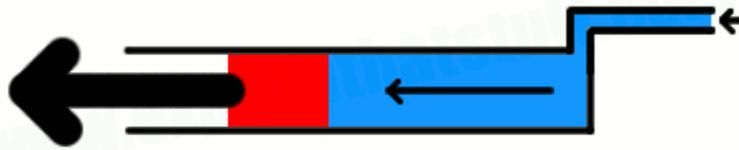
Each ram is working like a diesel-powered water pistol in reverse:



Photo: Close-up of a digger's hydraulic rams.

The engine is pumping hydraulic fluid through one of the thin pipes to move the thicker ram out with much greater force, like this:

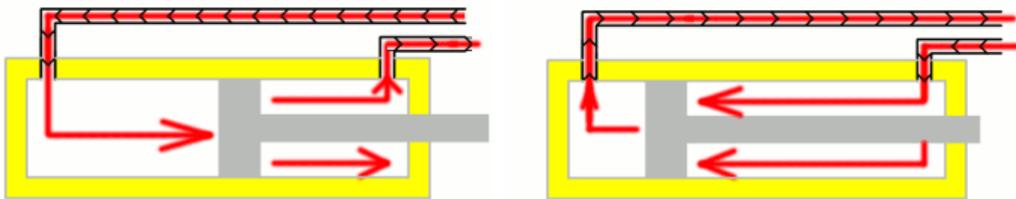
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www.explainthatstuff.com

Photo: How a hydraulic ram multiplies force.

You might be wondering how a hydraulic ram can move both inward and outward if the hydraulic fluid is always pushing it from one direction. The answer is that the fluid doesn't always push the same way. Each ram is fed from opposite sides by two separate pipes. Depending on which way the fluid moves, the ram pushes either inward or outward, very slowly and smoothly, as this little animation makes clear:



www.explainthatstuff.com

www.explainthatstuff.com

Photo: A hydraulic ram moves either inward or outward depending on which direction the hydraulic fluid is flowing.

Next time you're out and about, see how many hydraulic machines you can spot. You might be surprised just how many trucks, cranes, diggers, dumpers, excavators, and bulldozers use them. Here's another example: a hydraulic hedge-cutter on the back of a tractor. The cutting head needs to be sturdy and heavy to slash through hedges and trees and there's no way the driver could lift or position it by hand. Fortunately, the hydraulic controls do all that automatically: with several hydraulic joints, a bit like a shoulder, elbow, and wrist, the cutter moves with as much flexibility as a human arm:



www.explainthatstuff.com

Photo: A typical hydraulic hedge-cutter.

From: <http://www.explainthatstuff.com/hydraulics.html>

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Explicit Questions:

- What examples of uses for fluid power are shown in the text?
- What are the examples of hydraulic machines?

Implicit Questions:

- Make a sketch of one ram of the digger, then draw the two movements of the ram when fluid pushes in each direction.

Referential:

- Have you seen other applications of hydraulics?
- Could you imagine other uses?

Project: collaborative problem solving

Investigating and constructing simple pneumatic and hydraulic machines.

Step 1 Organise your work

- Identify a simple pneumatic/hydraulic machine you want to work on.
- In groups of four, choose a role for each person.
- What materials/knowledge do you need for your project? Write a list down.

Step 2 Define an objective

- In groups, decide on your objective.
- Design your idea. Justify your answers.
- List the materials you think you will need.

Step 3 Build your machine

- In groups build your machine.
- Take notes of the process: materials used, procedure, errors, modifications, ...

Step 4 Check the operation of your machine

- Check the actions, motions, etc of your machine. Is it a good solution to your objective?
- If the machine isn't working properly fix it.

Step 5 Conclusions

- Write some conclusions from your project individually and then share your ideas with your group.

Step 6 Making a poster

- Create a poster to represent your project then present it to the class.

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Assessment

PROJECT RUBRIC

Name:

Date:

CRITERIA	4	3	2	1
Required Elements	Student included more elements than was required.	Student included all the elements that were required.	Student included most elements that were required.	Student included some elements that were required.
Final product (x2)	The final product is exceptional in regards to meeting the project instructions and expectations.	The final product is very good in regards to meeting the project instructions and expectations.	The final product is good in regards to meeting the project instructions and expectations.	The final product does not reflect in regards the project instructions or expectations.
Originality	Project reflects an exceptional degree of student creativity.	Project reflects strong student creativity.	Project reflects some creativity by the student but may be based on the designs / ideas of others.	Project lacks overall student creativity.
Attractiveness	The project is exceptionally attractive in terms of design, layout, neatness and overall presentation.	The project is attractive in terms of design, layout, neatness and overall presentation.	The project is acceptably attractive and laid out, although more time could have been spent on the overall presentation of the project.	The project lacks attractiveness and the overall presentation is lacking in design, neatness or layout. The project is still in the "draft" stage and not fully complete.
Comprehension	Student is able to accurately answer almost all questions posed by classmates.	Student is able to accurately answer most questions posed by classmates.	Student is able to accurately answer a few questions posed by classmates.	Student is unable to accurately answer questions posed by classmates.
Health and Safety	Student always complies with Health and Safety regulations	Student most of the times complies with Health and Safety regulations	Student sometimes complies with Health and Safety regulations	Student doesn't sufficiently comply with Health and Safety regulations.

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CONSTRUCTION NOTES RUBRIC

Name: _____

Date: _____

CRITERIA	4	3	2	1
Accuracy / Content / Knowledge (x2)	All information / content appears to be accurate.	Almost all information / content appears to be accurate.	Most of all information / content appears to be accurate.	Some of the information / content appears to be accurate.
Organization	Content is well organized using headings or bulleted lists to group related material.	Uses headings or bulleted lists to organize and there is some evidence of the overall organization of topics	Uses headings or bulleted lists to organize, but the overall organization of topics appears flawed.	There was no clear or logical organizational structure, just lots of facts.
Clarity and Relevance	Graphics / skits are all clear and relevant.	Almost all graphics / skits are clear and relevant.	Some graphics / skits are clear and relevant.	Few graphics / skits are clear and relevant.

Comments: _____

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TEAM WORK RUBRIC

Name:

Date:

CATEGORY	4	3	2	1
Team member	A true team member who contributes a lot of effort, and encourages and supports the efforts of others in the group.	A strong group member who tries hard!	Sometimes a satisfactory group member who does what is required	Sometimes chooses not to participate and does not complete assigned tasks.
Listening	Respectfully listens and interacts with other members of the group.	Listens and interacts with other members of the group.	Has some difficulty respectfully listening and discussing.	Has difficulty listening and argues with teammates.
Research and Information-Sharing	Actively looks for and suggests solutions to problems.	Refines solutions suggested by others.	Does not suggest or refine solutions, but is willing to try out solutions suggested by others	Does not try to solve problems or help others solve problems.
Problem-Solving	Always has a positive attitude about the task(s) and the work of others.	Usually has a positive attitude about the task(s) and the work of others.	Occasionally is publicly critical of the task(s) or the work of other members of the group.	Is often negative and publicly critical of the task(s) or the work of other members of the group.
Group / Partner Team work	All team members contributed equally to the finished project.	Assisted group / partner in the finished project.	Finished individual task but did not assist group / partner during the project.	Contributed little to the group effort during the project.
	Always did the assigned work.	Completed most of the assigned work.	Completed some of the assigned work.	Relied on others to do the work.

Based on the rubric from:

<https://www2.uwstout.edu/content/profdev/rubrics/secondaryteamworkrubric.html>

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ORAL PRESENTATION RUBRIC

Name: _____

Date: _____

CRITERIA	4	3	2	1
Required elements and organization	Includes everything required in presentation and is well organized.	Includes most required information in presentation and is mostly organized.	Includes some of required information in presentation and is partly organized.	Does not include everything required in presentation and it lacks organization.
Voice, body and eye contact.	Speaks clearly and with confidence, maintaining eye contact during the entire presentation. Very well prepared to present.	Speaks clearly and with confidence, maintaining eye contact during much of the presentation. Prepared to present.	Speaks fairly clearly and with some confidence, maintaining eye contact during some of the presentation. Student(s) could have used more time to prepare.	Lacking in clarity when speaking, lacking in eye contact and/or confidence. Not prepared to adequately present.
Volume	Speaks loudly always.	Speaks loudly most of the time.	Speaks loudly sometimes.	Does not speak loudly most times.
Appropriately speaking	Speaks appropriately for the situation, using suitable language always.	Speaks appropriately for the situation, using suitable language most of the time.	Speaks appropriately for the situation, using suitable language sometimes.	Does not speak appropriately for the situation, not using suitable language.
Comprehension	Student is able to accurately answer almost all questions posed by classmates.	Student is able to accurately answer most questions posed by classmates.	Student is able to accurately answer a few questions posed by classmates.	Student is unable to accurately answer questions posed by classmates.

Comments:

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Checklist

In this unit you have...

Name: _____

Group name: _____

Product: _____

Goal: _____

✓	STEPS	COMPLETATION DATE

Notes:
