



LET'S TALK ABOUT ... HEAT

SCRIPT AND TEACHING MATERIALS

The driving question: "WHAT HEAT IS?"

The scenario will need 3 hours. Teacher could adapt the activities (order and number) according to the deeper study of the scenario. Some activities could be done and not others (for example, I propose to do at home the activities about the videos, it is optional). The same for the activities proposed to do at home (scale-up). Activities can be done in groups (pairs ) or individual . Teacher could propose the way of work.

In case teacher wants to follow the entire scenario, the activities proposed for each session will be the below:

Scenario Overview

Session	Activities	Content-obligatory Language// Solving equations	Timing	Skills Reading Writing Listening Speaking Interaction Drawing ICT Calculating Underlining	Interaction T-S S-S	Assessment Peer assessment Self-assessment Teacher assessment ...
1	Introducing topic	Introducing the topic (Heat)	5'	L/S/IN	T-S	
	Read/Explain introductory text. Solving doubts.	Heat. Energy	5'	R/S/IN/L	S-S	T A
	Previous activity and self-assessment.	Heat. Energy units. Temperature scales. Heat transfer.	20'	R/W	S	S A
	Activity 1. Read/Explain the text "Heat". Solving doubts. Write definitions.	Energy, heat, heat units (calorie, joule), temperature, thermometer electricity, force and distance. Solving conversion factors. Write definitions.	15'	R/W/S/IN/L	S-S T-S	T A
	Activity 2	Solving conversion factors. Units of heat.	5'	R/W/IN/S/C	S-S	T A P A*
	Summarize contents. Discussion in class.	Heat, heat units, temperature, thermometer.	10'	L/S/IN	T-S S-S	
2	Review things studied first day.	Heat	5'	S/IN/L	T-S S-S	
	Read/Explain the text "Temperature scales"	Temperature, Celsius scale, Fahrenheit scale, Kelvin scale.	10'	IN/S/R/L	T-S S-S	TA
	Activity 3. Underline the text "Temperature scales" following the instructions or write the equations and examples following the instructions.	Temperature, Celsius scale, Fahrenheit scale, Kelvin scale.	10'	R/W/IN/U	S-S	T A
	Activity 4.	Temperature scales.	5'	W/IN/S/R/C	S-S	T A P A*
	Activity 5	Temperature scales.	10'	W/IN/S/R/C	S-S	T A P A*

	Activity 6	Energy, heat, temperature, energy resources. Giving opinions.	10'	IN/S/W	S-S	T A
	Summarize contents. Discussion in class.	Heat, temperature scales, energy resources.	10'	IN/S	T-S S-S	
	Explain/Read text "Heat transfer". Solving doubts. Optional the video from youtube: https://www.youtube.com/watch?v=FTSBtx5jhaY , and the video with final interaction: https://www.youtube.com/watch?v=zvQZtpZnRRE	Heat transfer, conduction, convection, radiation.	5'	R/IN/L/S	T-S S-S	
	Activity 7	Heat transfer, conduction, convection, radiation.	5'	IN/S/W/R	S-S	T A P A*
	Activity 8	Heat transfer, conduction, convection, radiation. Energy resources.	5'	IN/S/W	S-S	T A P A*
	Explain/Read text "How we obtain heat?. Energy conversion". Solving doubts.	Heat, energy resources and energy conversion.	10'	R/S/IN/L	S-S T-S	
3	Activity 9	Heat, energy resources, energy conversion. Write descriptions.	5'	IN/S/W	S-S	T A
	Activity 10	Heat. Energy conversion.	5'	R/S/W/IN	S-S	T A P A*
	Activity 11	Energy resources. Write comparisons.	5'	W/S/IN/L	S-S	T A P A*
	Read/explain text "Endothermic and exothermic reactions". Optional watch the video about endothermic and exothermic reactions or processes, from youtube: https://www.youtube.com/watch?v=dID0pJTmjME , in which appears some examples from activity 12.	Heat, heat conversion, endothermic and exothermic reactions.	5'	R/S/IN/L	T-S S-S	
	Activity 12	Heat, energy conversion. Giving opinions.	5'	IN/S/W	S-S	T A
	Final discussion about topic.	Heat, heat units, temperature scales, heat transfer, heat conversion. Students can do the self-assessment of the unit at home.	10'	S/W/IN	T-S S-S	

S = Student

P A* = All the activities in pairs are assessed in **peer assessment** (corrected by different partners/groups in class. A group corrects the work done by other group, following the teacher instructions). For example, teacher can project the answers in a PowerPoint (or similar) and each group assesses the work done by other group.

S A* = All the activities are assessed in **self-assessment**

Activities can be done in groups (pairs) or individual.

Comments:

- Form heterogeneous groups to observe diversity.
- Foment team work (cooperative work)
- Foment creative thinking.
- Encourage and promote students to express themselves and their ideas.
- Introduce texts and activities positively.
- Provide positive feedback during the student' learning process.
- Provide grammar help (scaffolding) and examples.
- Promote student' critical thinking when offering a solution/answer to a problem (by asking questions about the solution proposed).
- Teacher should help students trying not to use the L1.
- Teacher should provide additional resources, solutions or options to students, if needed.
- Teacher should propose scaled activities according to the student' typology. Important is to proposed scale-up activities.
- Teacher should use a language understandable for students, using words, sentences and constructions according to the student's level (content and language).
- Optional to change partners day by day. It could help students to work with different kind of people. In this case, students will need one "peer assessment table" for each partner.
- Optional videos can help students to understand better the topics.

ACTIVITIES RESOLUTION

Each activity has the punctuation (For teacher assessment)

Activity	Instructions	Solutions
Read/Explain the introductory text "Heat"	Read/Explain the text and solve doubts. Possible discussion.	
Previous activity	Each student has to answer the questions in order the teacher to know the previous knowledge about energy of each of them.	Given in the student' worksheet. Self-assessment.
<p>FROM ACTIVITY 1 UNTIL ACTIVITY 12, WORK IN PAIRS (POSSIBLE INDIVIDUAL WORK ACCORDING TO THE TEACHER). TEACHER COULD MAKE THE GROUPS (MIXING STUDENTS WITH DIFFERENT ENGLISH AND/OR TECHNOLOGY LEVELS (HETEROGENEOUS GROUPS))</p> <p>IN ACTIVITY 6, GROUP IN PAIRS INTERACTS WITH OTHER GROUP IN PAIRS (POSSIBLE INTERACTION BETWEEN INDIVIDUAL STUDENTS).</p>		
Activity 1 Read/Explain text "Heat". After that, write definitions	Read/Explain the text and solve doubts. Possible discussion. After that write definitions.	<p>Lots of possible definitions. According to the text:</p> <p>Temperature: Temperature is a measure of how hot something is / is the measure of the amount of heat content possessed by it.</p> <p>Calorie: A calorie is the energy we need to increase 1°C the temperature of 1 gram of water.</p> <p>Thermometer: A thermometer is an instrument for measuring temperature.</p>
Activity 2	Solve problems conversion factors.	$4180 J \cdot \frac{1 cal}{4.18 J} = 1000 cal$ $1500 cal \cdot \frac{4.18 J}{1 cal} = 6270 J$ $2.5 KJ = 2500 J \cdot \frac{1 cal}{4.18 J} = 598.1 cal$ $3.5 Kcal = 3500 cal \cdot \frac{4.18 J}{1 cal} = 14630 J$
Activity 3 Read/Explain text "Temperature scales"	Read/Explain the text and solve doubts. Possible discussion. Students have to underline, with different colors, parts of the text following the instructions. Optional, students can do a mind map with the information or copy the equations and the examples.	
Activity 4	Solve problem.	$T (^{\circ}C) = \frac{5}{9} \cdot (200 - 32) = 93.3 ^{\circ}C$ $T (K) = 150 + 273 = 423 K$
Activity 5	Match temperatures with pictures. Students should express all the temperatures in the Celsius scale temperature.	<p>1 = c 2 = b 3 = a (example) 4 = e</p> <p>5 = g 6 = d 7 = h 8 = f</p>
Activity 6	Students (in two groups of two students) discuss about the answers given in activity 5, and write some answers given by the nearer group. HELP: "HOW TO GIVE OPINIONS?"	Multiple possible answers.

Read/Explain text "Heat transfer "	Read/Explain the text and solve doubts. Possible discussion.	
Activity 7	Students have to read the text "Heat transfer in our life", and fill in the gaps (with a number) with the correct word: "convection, conduction or radiation"	1 = convection 2 = conduction 3 = radiation
Activity 8	Students have to put the number of the picture in its correct column according to the heat transfer. Some pictures can be put in more than one column. Each correct answer one point.	Radiation: 1 (example), 2, 3, 4, 5, 6, 7, 8, 9, 11. Convection: 1 (example), 4, 9, 10, 12. Conduction: 1 (example), 4, 6, 8, 9.
Read/Explain text "How can we obtain heat? Energy conversion "	Read/Explain the text and solve doubts. Possible discussion.	
Activity 9	Students have to write 5 different ways to obtain heat, following the example.	Multiple possible answers.
Activity 10	Students have to put a cross if the situations are a use of heat. Each correct answer (a cross if it's a use of heat, and not a cross if there isn't) one point.	1. X 2. X 3. 4. X 5. X 6. 7. 8. X 9. X 10.
Activity 11	Students have to write the reason for the situation proposed. They can use, as a help, the "Help: Relation cause-effect. Giving reasons"	Multiple possible answers.
Read/Explain text "Endothermic and exothermic reactions "	Read/Explain the text and solve doubts. Possible discussion.	
Activity 12	Students have to put a cross according to if the reactions are endothermic or exothermic reactions, following the example. Each correct answer one point.	Endothermic reactions: 1, 4, 5, 8, 9, 12, 15, 17, 18, 19. Exothermic reactions: 2, 3, 6, 7, 10, 11, 13, 14, 16
Final discussion	Discuss with all the class the main ideas about the topic. Teacher should encourage students to participate. If not, teacher should propose ideas.	

TEACHING ACTIVITIES' ASSESSMENT (RUBRIC)

Activity	Punctuation
1	/6
2	/8
3	/5
4	/4
5	/7
6	/3
7	/3
8	/11
9	/5
10	/10
11	/5
12	/19
TOTAL	/86

TEACHING SPEAKING ASSESSMENT (RUBRIC)

What to assess (student :)	1	2	3	4
Interacts with partners and in class				
Proposes solutions				
Gives ideas/opinions				
Respects the ideas proposed by partners				
Good level of English				
Good level of contents (in speaking activities)				
Follows the rules				
Cooperates in activities (working in groups)				
Facilitates conversations				
Brings material				
TOTAL (Final punctuation)	/40			

FINAL ASSESSMENT

I suggest as a final assessment: 70% T.A. (Teacher assessment) + 20% S.A. (Self-assessment) + 10% P.A. (Peer assessment)

Suggestion for future development and expansion of the future

I suggest expanding the scenario introducing the different energy resources and their uses, electricity (transport distribution, transformation, uses, etc.), how a power station works (different power stations), environmental problems due to the use of the energy, the rational use/consumption of energy and resources (materials, etc.).