CORSO CLIL IPRASE 2017-2018

LIGHT AND SHADOWS

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School Grade	Primary ☒	Middle ☐	High ☐		
School Year	1 ☐	2 ☐	3 ☐	4 ☐	5 ☒
Subject :	SCIENCE	**Topic:**	LIGHT ENERGY: PROPERTIES OF LIGHT AND SHADOWS		
CLIL language	English ☒	Deutsch ☐			

Personal and social-cultural preconditions of all people involved	The members of the class group are twenty-two, seven males and fifteen females. There are three children with different learning difficulties (two students have low cognitive abilities and one is dyslexic) and one child with a special needs teacher (borderline intelligence). These pupils have some learning difficulties related to cognitive development and need often scaffolding. Fortunately there are 7/8 talented pupils who absorb the language and the new contents very quickly and usually help the weaker students. The majority of the class is very good and respectful with their peers and their teachers but there is a child who sometimes doesn't respect the rules and is too noisy. The pupils have been studying English for the first year of the primary school (two weekly hours) and they have started to learn Art (CLIL) and Science (CLIL) in the third class. They are doing two weekly hours of English (on Tuesday and on Thursday), two weekly hours of Science in CLIL (on Wednesday) and one weekly hour of Art in CLIL (on Friday). The children are used to work independently, they work well in groups and they are able to collaborate. They are motivated during CLIL lessons and most of them are very interested in science and in making experiments. Art is one of their favourite school subjects. During Art and Science lessons they often develop HOTS when they have to make hypotheses, discuss, and elaborate something. **Teaching team profile**: main teacher (Scaglia Lara). **Student group profile**: although there are different levels and efforts in learning content and language, after three years of CLIL, the class is now able to understand concepts and instructions expressed only in English by focusing on key words. The Average CEFR level achieved by the pupils is A1.

	Subject	Language
Students' prior knowledge, skills, competences	This topic is a part of a large lesson plan related to the concept of energy. During the school year the students worked on the concept of energy through experiments, group works and field trips. These topics have already been covered: • energy and forms of energy (mechanical, electrical, light energy); • kinetic and potential energy; • renewable and non-renewable resources; • some basic concepts concerning mechanical energy and the importance of machines as tools to facilitate human activities (levers, pulleys, gears...); • some basic concepts related to electricity (and related visit to Storo hydroelectric power plant). In the last period the students have been working on the concept of light energy through videos observation, discussions of the topics covered and well-structured group work. In a darkened room the students also tested their predictions and then learned: • light is a form of energy; • light travels in a straight line; • some properties of light (refraction, reflection and diffraction); • light is a blend of all colours and can be separated into individual colours (Netwon's prism).	The students: • have very good listening and speaking skills; • have good reading and writing skills; • know the language of the class; • are able to understand instructions expressed in L2; • can understand and do spelling in L2; • are able to understand and use the verbs can/be/have; • are able to ask the following questions: "can you repeat please?", "can you help me?", • are able to understand and answer simple questions about scientific method : "can you list..?", "can you draw…?", "can you describe...?", "can you explain…?" , "which one…?", "what can you say about…?", "can you predict…?", "are you all agree…?", "what is your opinion of…?", "how would you summarise…?", • are able to form simple sentences : "in my opinion it can ….", "I think…", • know the vocabulary, grammatical structures and functional language of specific subject (content obligatory language): "mechanical energy", "electrical energy", "light energy", "thermal energy" , "sound energy", "renewable and non renewable resources",

		" when the light hits an object it can…." , "the light moves…" "refraction", "reflection" , "diffraction", • know the everyday, less formal language which is used in the subject (content compatible language): "number", "big /small/short/long", "size", "hypothesis", • know some frequency words: "about", "across", "many", "back".

Timetable fit	○ **Lesson**	**Lessons length**: 2 lessons (220minutes)
Description of teaching and learning strategies	• **Brainstorming /warm up**: they are used to generate a large number of ideas quickly. They actively engage students in the learning process and encourage full participation. • **Group work**: the teacher uses small groups (4-5 pupils) in which students work together to improve learning. The students work in groups to make experiments with light and different objects. • **Pair work**: it is used to increase the student's talking time (talented students are "used" as tutors). • **Communicative teaching**: teaching activities are based on real communicative situations and they aren't continually interrupted by the teacher who in his role as guide don't obstruct production by continually correcting. • **Scaffolding**: the teacher uses various materials and strategies for the different cognitive levels in the class, to guide the learning processes and to allow students to do a task or find solutions. • **Realia**: teacher provides pupils real objects to observe and touch to help students in the learning process (**learning by doing**). • **Video**: exposure to a video makes language learning more effective by combining listening to images and facilitating the understanding of the vocabulary.	

Overall Module Plan (ENERGY)

Unit number 1 **ENERGY** **Unit length:** 110 Minutes (1 lesson)	**Lesson number 1: what is energy?** • Teacher uses a brainstorming activity to introduce the new topic: energy. • Children watch a video about energy and discuss. • Children copy the brainstorming and the definition of energy on their exercise book. • Children write and memorise the energy acronym.

Unit number 2 **RENEWABLE AND NON RENEWABLE RESOURCES** **Unit length:** 110 minutes (1 lesson)	**Lesson number 1: renewable and non renewable resources.** • Oral Review. • Teacher shows different flashcards about renewable and non renewable resources. • In groups children discuss and discriminate the cards about renewable and non renewable resources and make a poster. • Students compare the group work. • Children copy and draw the results on their exercise book.

Unit number 3 **MECHANICAL ENERGY** **Unit length:** 110 minutes (1 lesson)	**Lesson number 1: mechanical energy.** • Oral review. • Teacher explains the definition of mechanical energy (energy of movement). • Teacher shows the use of some simple machines (lever, inclined plane, wheel and axle, pulley, screw, wedge, gears). • By using a scaffolding sheet, children in groups analyse and record some ideas about the machines. • Students compare and explain different ideas about the machines. • Children write and draw on their exercise book the group work (basic concepts concerning mechanical energy and the importance of machines as tools to facilitate human activities).

Unit number 4 **ELECTRICAL ENERGY** **Unit length:** 110 minutes (1 lesson)	**Lesson number 1: what is electrical energy?** • Oral review. • Teacher shows a video about electrical energy and the different sources of energy used to generate electricity. • Children observe a circuit. • By using a scaffolding sheet, in pair children build a very simple electrical circuit. • Pupils compare the pair work. • Children write and draw on their exercise book their circuit.

Unit number 4 **ELECTRICAL ENERGY** **Unit length** 110 minutes (1 lesson)	**Lesson number 2: visit to Storo hydroelectric power plant.** • Oral review. • Visit to Storo hydroelectric power plant (ENEL). • Children and teacher discuss about the visit. • Work group: children make a poster.

Unit number 5 **LIGHT ENERGY** **Unit length:** 110 minutes (1 lesson)	**Lesson number1:light and its properties.** • Oral review. • By using a video, teacher shows different sources of light. • Light game. • By using scaffolding sheets in a darkened room, children in groups do different experiments about properties of light (light travels in a straight line, refraction, reflection, diffraction and different colours if light). • Pupils compare the group work. • Children write and draw on their exercise book the work.

Unit number 5 **LIGHT ENERGY** **Unit length:** 110 minutes (1 lesson)	**Lesson number 2: properties of light on different objects.** • Oral review. • Teacher uses a brainstorming activity to introduce the new topic. • Teacher shows different objects (realia) and provides pupils scaffolding materials to introduce the properties of light when it hits different materials. • Students discuss in pair on what they think they would see on the different objects. • Teacher distributes the explanation sheet and invites the children to read. • In groups children explore properties of light on different objects. • Students compare the results achieved. • Children write and draw the work on their exercise book.

Unit number 5 **LIGHT ENERGY** **Unit length:** 110 minutes (1 lesson)	**Lesson number 3: light and shadows.** • Oral review. • Warm up activity (video). • Teacher gives objects and scaffolding materials to introduce the properties of shadows and the group work. • In a darkened room, by using scaffolding, in groups, children explore properties of shadows. • Pupils compare the results achieved by reading and discussing the data. • Children write and draw the work on their exercise book.

Unit number 6 **THERMAL ENERGY** **Unit length:** 110 minutes (1 lesson)	**Lesson number 1: thermal energy.** • Oral review. • Warm up activity (video). • Teacher gives objects and scaffolding materials to introduce the properties of thermal energy. • By using scaffolding materials, in groups, children explore properties of thermal energy. • Pupils compare the results achieved by reading and discussing the data. • Children write and draw the work on their exercise book.

Unit number 7 **SOUND ENERGY** **Unit length:** 110 minutes (1 lesson)	**Lesson number 1: sound energy.** • Oral review. • Warm up activity (video). • Teacher provides different musical instruments and scaffolding materials to introduce the properties of sound energy. • By using scaffolding materials, in groups, children do experiments and games about sound energy. • Children write and draw the work on their exercise book.

Unit number 8 **ENERGY REVIEW** **Unit length:** 110 minutes (1 lesson)	**Lesson number 1: energy review.** • With the help of an external expert (PAT) the pupils play various games and activities related to energy and its forms.

CLIL Lesson Plan

Unit number 5	**Lesson number 2**	Title: **PROPERTIES OF LIGHT ON DIFFERENT OBJECTS**

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1 **Brainstorming**	15 minutes	Students are able to: • activate prior knowledge; • understand a new topic; • be interested by a new concept; • feel involved in a new activity; • make connections between ideas/concepts; • organise and clarify ideas.	The teacher introduces the new topic with a brainstorming activity writing the simple words "light and shadows" at the blackboard and asking what they means to the class. Students express possible answers, key words and ideas and discuss. Contributions are summarised on the blackboard by the teacher, then the pupils copy the brainstorming activity on their	*Skills* ~~L~~ ~~S~~ ~~R~~ ~~W~~ *Key vocabulary:* • Shadow • Light • Shape • Movement • Travel *Communicative structures:* • "What does "shadow/light" means?" • "Where do you see shadows/light? • "From where comes the light?" • "How does the light	• Whole class • Individual work	• Blackboard • Pencil case • Exercise book	INITIAL / FORMATIVE ASSESSMENT Through observation and handing in their brainstorm work students are assessed and evaluated by the teacher. The teacher assess both linguistic skills and prior knowledge about the content.

			exercise book.	travels?" • "The shadow is…" • "I can see the shadow…" • "The light travels…."			
2 **Materials and scaffolding structures presentation**	10 minutes	Students are able to: • identify different objects; • recognize and name different objects; • repeat new concepts; • make connections between new concepts; • organise and clarify ideas.	The teacher tell the students that they will now explore what happens when light shines on different kinds of objects that are opaque, clear, or shiny. The teacher shows different materials: glass, glass jar, transparent plastic bag, emery paper, plastic, notebook paper, wood, hand, brick. The teacher gives the children some coloured cards in which there are the names of the different materials shown. The teacher asks the children to	Skills ~~L~~ ~~S~~ ~~R~~ W *Key vocabulary* • Opaque • Clear • Shiny • Glass • Glass jar • Transparent bag • Plastic • Notebook • Paper • Wood • Emery paper • Brick • Light • To hit/shine *Communicative structures:* • "This is…" • "Is this…?" • "Can you repeat please?"	• Whole class	• Different materials: glass, glass jar, transparent plastic bag, emery paper, plastic, notebook paper, wood, hand, brick (**attachment n.1**). • Coloured cards with the names of the different materials shown **(attachment n. 2).**	FORMATIVE ASSESSMENT Through observation and listening to the students, teacher assesses both the learners' linguistic skills (listening, speaking and reading) and the comprehension of content (the use of specific vocabulary connected to the correct material).

			repeat the names of the different materials showing the same material at the same time.				
3 **Pair work: make hypotesis**	10 minutes	Students are able to: • remember the main characteristic of light; • analyse and discuss about characteristics of light; • hypothesize, deduce and imagine possible changes in the behavior of light on different objects; • summarise different ideas; • take note of conclusions achieved by the discussion.	The teacher asks the students to pretend to have a torch and to illuminate different objects. The teacher asks students suggest some ideas about how light moves and hits the objects. The students discuss in pair on what they think they would see on the different objects. They should pay particular attention to where the light would go after it hits the object and they record this for each object.	Skills ~~L~~ ~~S~~ R ~~W~~ *Key vocabulary:* • light • torch • to illuminate *Communicative structures:* • "What can you say about….?" • Can you predict…?" • "What is your opinion about…?" • "In my opinion it…." • "I think…. "	• Whole class • Pair work	• Notebook • Pen	PEER EVALUATION In pair children share ideas and make hypotheses and predictions about the topic (HOTS). In this way, pupils can receive and give a feedback and correct each other.
4 **Scaffolding worksheet**	15 minutes	Students are able to: • listen and	The teacher distributes the explanation sheet	Skills ~~L~~ ~~S~~ ~~R~~ W	• Whole class	• Scaffolding worksheet (**attachme**	FORMATIVE ASSESSMENT / PEER

		read new information about light; • repeat new concept about light properties; • illustrate new information matching the pictures with the correct word; • classify and memorise new words and concepts about light energy.	and invites the children to read. In turn, children repeat the explanatory phrases together with the teacher.	*Key vocabulary:* • light • torch • to illuminate • to pass/do not pass • partially *Communicative structures:* • "Listen, read and repeat" • "In a…..object the light can/ can't/ can partially pass" • " In a… object can it pass?"		**nt n.3)**	EVALUATION Listening to the students, the teacher assesses the learners' linguistic skills (listening, speaking and reading) ,the comprehension of the new vocabulary and the linguistic structures. During this activity children correct each other the incorrect pronunciations.
5 **Group work: exploring properties of light on different objects**	50 minutes	Students are able to: • work together to achieve a goal; • analyse and discuss about characteristics of light; • hypothesize, deduce and imagine	In a darkened room the teacher asks the students to test their predictions on various objects. In groups the students light each object with torches	*Skills* ~~L~~ ~~S~~ ~~R~~ W *Key vocabulary:* • light • torch • to illuminate • to pass/do not pass • partially	• Group work	• Different materials: glass, glass jar, transparent plastic bag, emery paper, plastic, notebook paper, wood,	PEER EVALUATION. In group children share ideas and make hypotheses and predictions about the topic (HOTS). They interact to find solutions

		possible changes in the behavior of light on different objects; • modify and adapt ideas during the experiments; • choose conclusions; • summarise and agree about different ideas; • take note of conclusions achieved by the experiments.	and record on the sheet how the light interacts with the objects by gluing the coloured cards in the right place.	• Opaque • Clear • Shiny • Glass • Glass jar • Transparent bag • Plastic • Notebook • Paper • Wood • Emery paper • Brick • To hit/shine *Communicative structures:* • "In … light can/ can't/ can partially pass" • " In my opinion…" • "I can see…"		hand, brick (**attachment n.1**). • Coloured cards with the names of the different materials shown (**attachment n.2**). • Scaffolding worksheet (**attachment n.3).** • Torch (one for each group). • Glue (one for each pupil).	and conclusions. In this way, pupils can receive and give a feedback and correct each other.
6 **Check for understanding: compare and discuss results**	10 minutes	Students are able to: • identify and classify light characteristics on different objects; • express opinions and	The students will compare the results achieved by reading the various completed sentences .	Skills ~~L~~ ~~S~~ ~~R~~ W *Key vocabulary*: • light • torch • to illuminate	• Whole class • Group work	• Completed scaffolding worksheet (**attachment n.4**	SUMMATIVE ASSESSMENT Through observation of worksheets and listening to the students, the teacher assesses

		experiences about light characteristics ; • summarise the experiments using the specific vocabulary.		• to pass/do not pass • partially • Opaque • Clear • Shiny • Glass • Glass jar • Transparent bag • Plastic • Notebook • Paper • Wood • Emery paper • Brick • To hit/shine *Communicative structures:* • "In … light can/ can't/ can partially pass" • "During the experiments we can see…"			both the learners' linguistic skills and the comprehension of content .

Unit number 5	**Lesson number 3**	Title: **LIGHT AND SHADOWS**

Activity	**Timing**	**Learning Outcomes**	**Activity Procedure**	**Language**	**Interaction**	**Materials**	**Assessment**
1 Warm up	20 minutes	Students are able to: • activate prior knowledge; • understand a new topic; • be interested by a new concept; • feel involved in a new activity; • make connections between ideas/concepts; • organise and clarify ideas.	The teacher starts the lesson with a warm up activity: in a darkened room the children watch a video, and make a "mime-shadow game" (they try to make / guess some animals shadows with their hands).	Skills ~~L~~ ~~S~~ ~~R~~ W *Key vocabulary:* • Light • Shadows • shape • Size • Guess • Mime • Dog • Rabbit • Deer • Snail • Snake • bird *Communicative structures:* • **"what is it?"** • **"It is…."** • **"Is it…?"**	• Whole class	• Interactive whiteboard (How to make Shadow Animals with your Hands - YouTube)	INITIAL / FORMATIVE ASSESSMENT Through observation and handing in their warm up activity the students are assessed and evaluated by the teacher. The teacher assess both linguistic skills and prior knowledge about the vocabulary and linguistic structures.

2 **Materials and lesson presentation**	15 minutes	Students are able to: • activate prior knowledge • analyse and discuss about characteristics of shadows; • organise and clarify ideas; • make connections between ideas/concepts.	Before the first day of lesson, students would have to walk around their country to observe lights and shadows. The pupils and the teacher discuss about it. The teacher explains the students that now, using a torch as light source, they will create the shadow of a black cardboard and project it on the wall to observe and analyse the behaviour of the light beam. The teacher forms 5 groups of children and distributes the cardboard (one for each group).	Skills ~~L~~ ~~S~~ R W *Key vocabulary* • Shadow • Shape • Size • Rectangle • Length • Height • Wall *Communicative structures:* • "what can you say about…?" • "I can see…" • "In my opinion…" • "I Think…"	• Whole class	• Black cut cardboard (**attachment n. 5)**	FORMATIVE ASSESSMENT Through observation and listening to the students, teacher assesses: the learners' linguistic skills, prior knowledge about vocabulary and linguistic structures and the pupils' ability to explain and demonstrate ideas or hypothesis**.**
3 **Group work: exploring shadows**	55 minutes	Students are able to: • work together to achieve a	In the darkened room the children work in groups to measure changes	*Skills* ~~L~~ ~~S~~ ~~R~~ ~~W~~	• Whole class • Group work	• Black cut cardboard (**attachm**	PEER EVALUATION. Children work in

		goal; • analyse and discuss about characteristics of shadow; • hypothesize, deduce and imagine possible changes in size of shadows when the light moves; • ask and answer questions about size changing of shadows; • modify and adapt ideas during the experiments; • elaborate conclusions; • summarise and agree about different ideas; • take note of conclusions achieved by the	in the size of the shadow of the rectangle projected on the wall when the light moves further and further away from the cardboard. Each pupil uses a support card (scaffolding) provided by the teacher to talk in L2 and a table to record the data.	*Key vocabulary:* • Shadow • Shape • Size • Rectangle • Length • Height • To measure *Communicative structures:* • "How long is the rectangle now?" • "How large is the rectangle now?" • "The rectangle is …..large." • "The rectangle is …long"		**ent n. 5)** • Meter (one for each group). • Rulers • Torch (one for each group). • A support card for dialogues **(attachment n.6)** • A data table **(attachment n. 7)**	group and interact to find solutions and record data. In this way, pupils can receive and give a feedback and correct each other.

		experiments					
4 **Check for understanding: compare and discuss data**	20 minutes	Students are able to: • identify and classify shadows characteristic; • express opinions and experiences about shadow characteristic; • summarise the experiments using the specific vocabulary.	The 5 groups will compare the results achieved by reading the data.	Skills L S R W *Key vocabulary:* • Shadow • Shape • Size • Rectangle • Length • Height • To measure *Communicative structures:* • "When the light is … away, the shadow is…." • "When the light is near, the shadow is big/large" • "When the light is far, the shadow is • small/short	• Whole class	• Completed scaffolding data table **(attachment n.8).**	SUMMATIVE ASSESSMENT. Through observation of worksheets and listening to the students, the teacher assesses both the learners' linguistic skills and the comprehension of content .

Lesson Plan Template realizzato a partire da materiale IPRASE precedentemente elaborato e riadattato con il coordinamento di Ludowica Dal Lago, in collaborazione con l'esperta CLIL Manuela Perini e la consulenza della docente Emanuela Atz per la versione in lingua tedesca.

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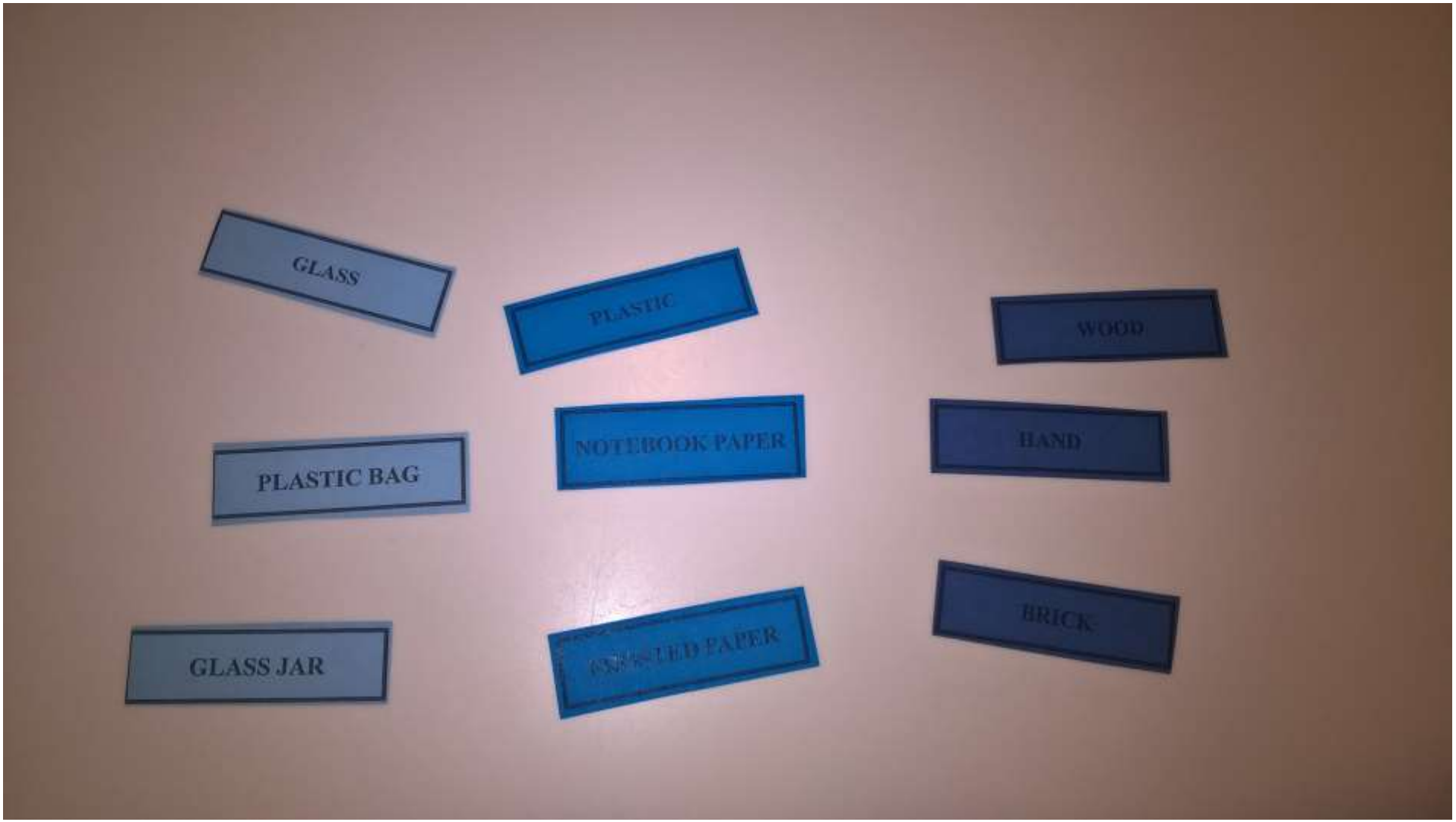
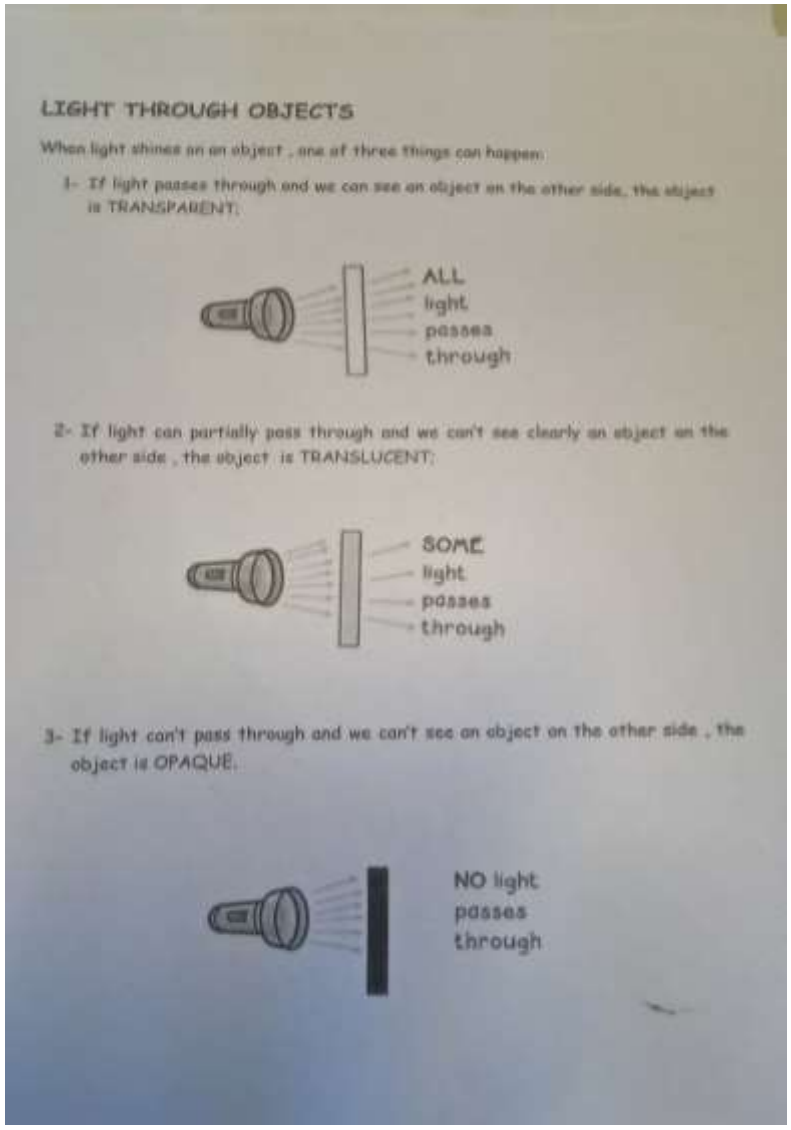
ATTACHMENTS

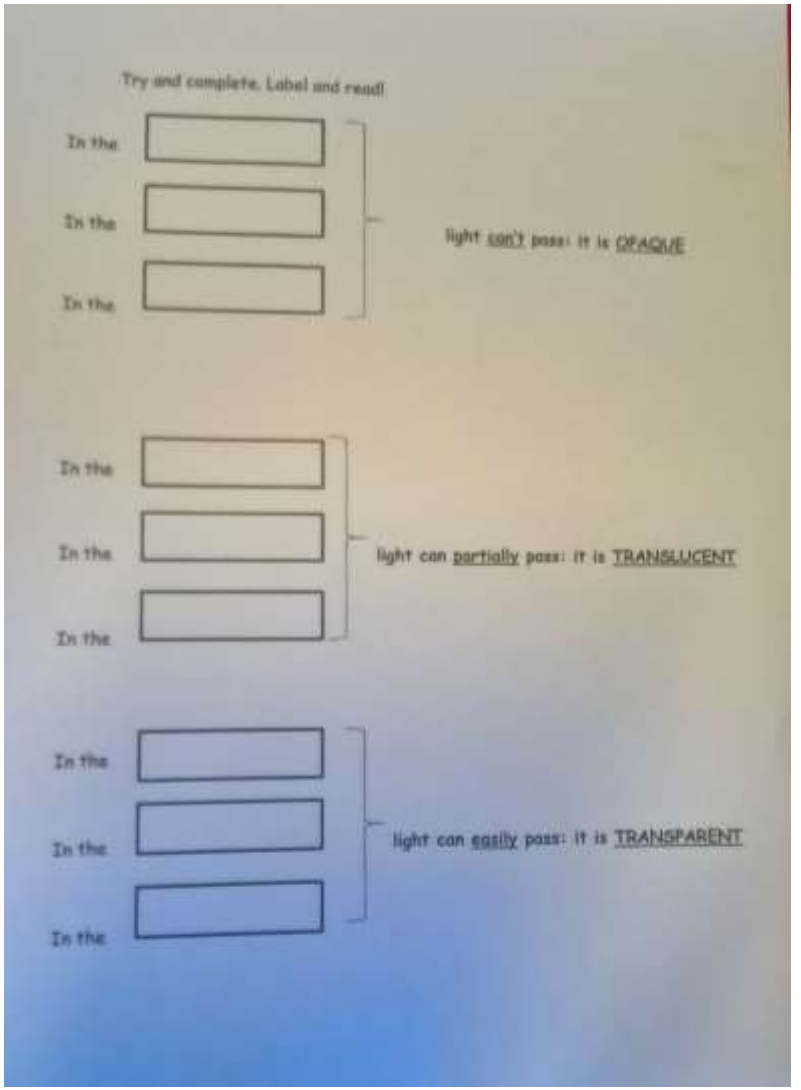
1)

2)

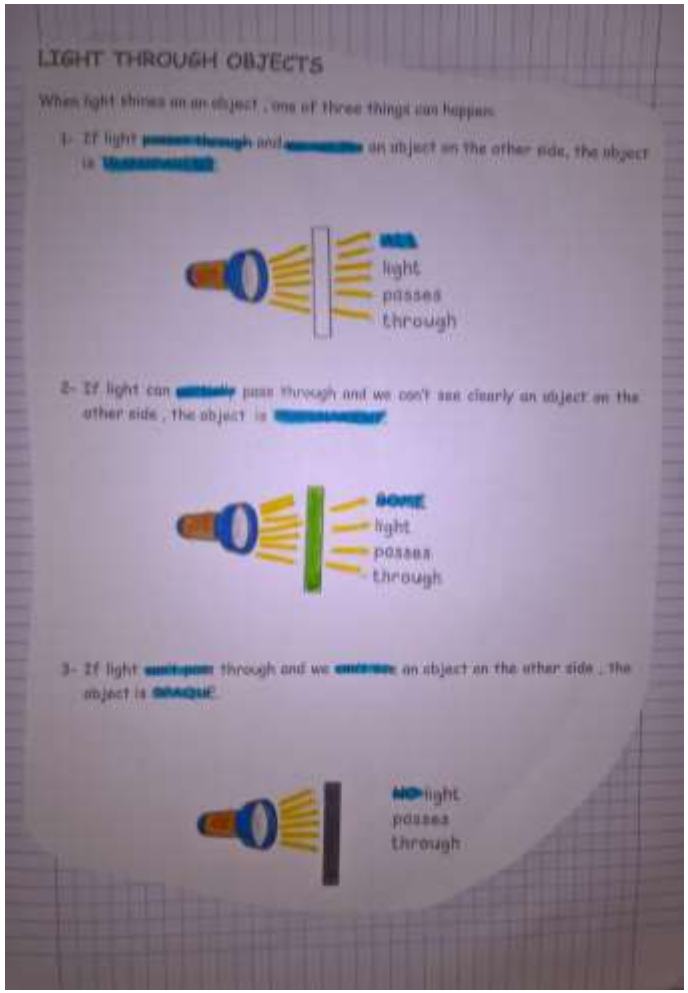

GLASS
PLASTIC
WOOD
PLASTIC BAG
NOTEBOOK PAPER
HAND
GLASS JAR
BRICK

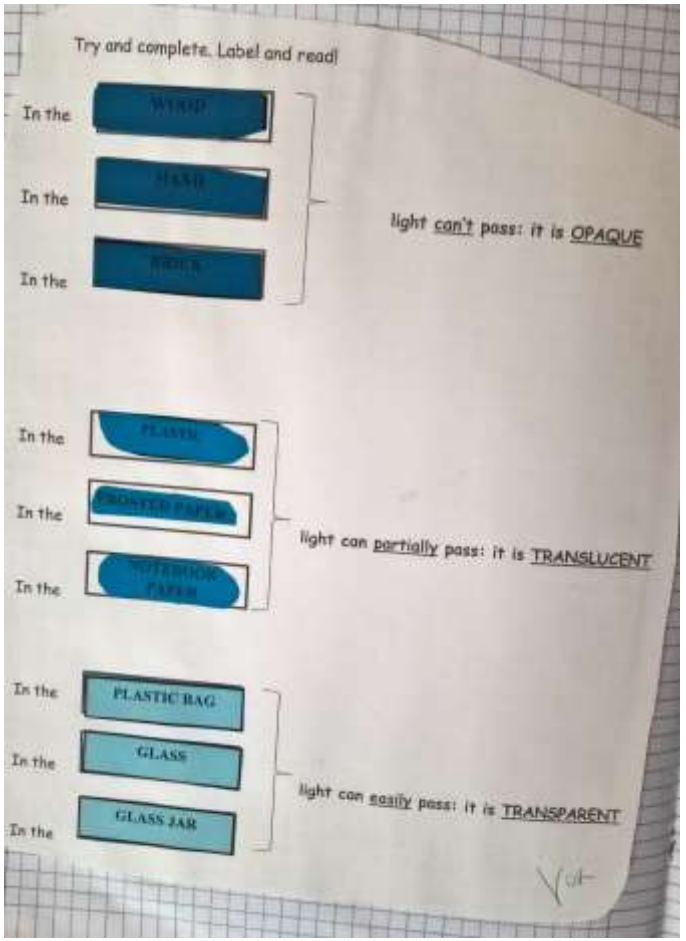
3)


LIGHT THROUGH OBJECTS
When light shines on an object , one of three things can happen:
1- If light passes through and we can see an object on the other side, the object is TRANSPARENT:
ALL light passes through
2- If light can partially pass through and we can't see clearly an object on the other side , the object is TRANSLUCENT:
SOME light passes through
3- If light can't pass through and we can't see an object on the other side , the object is OPAQUE.
NO light passes through

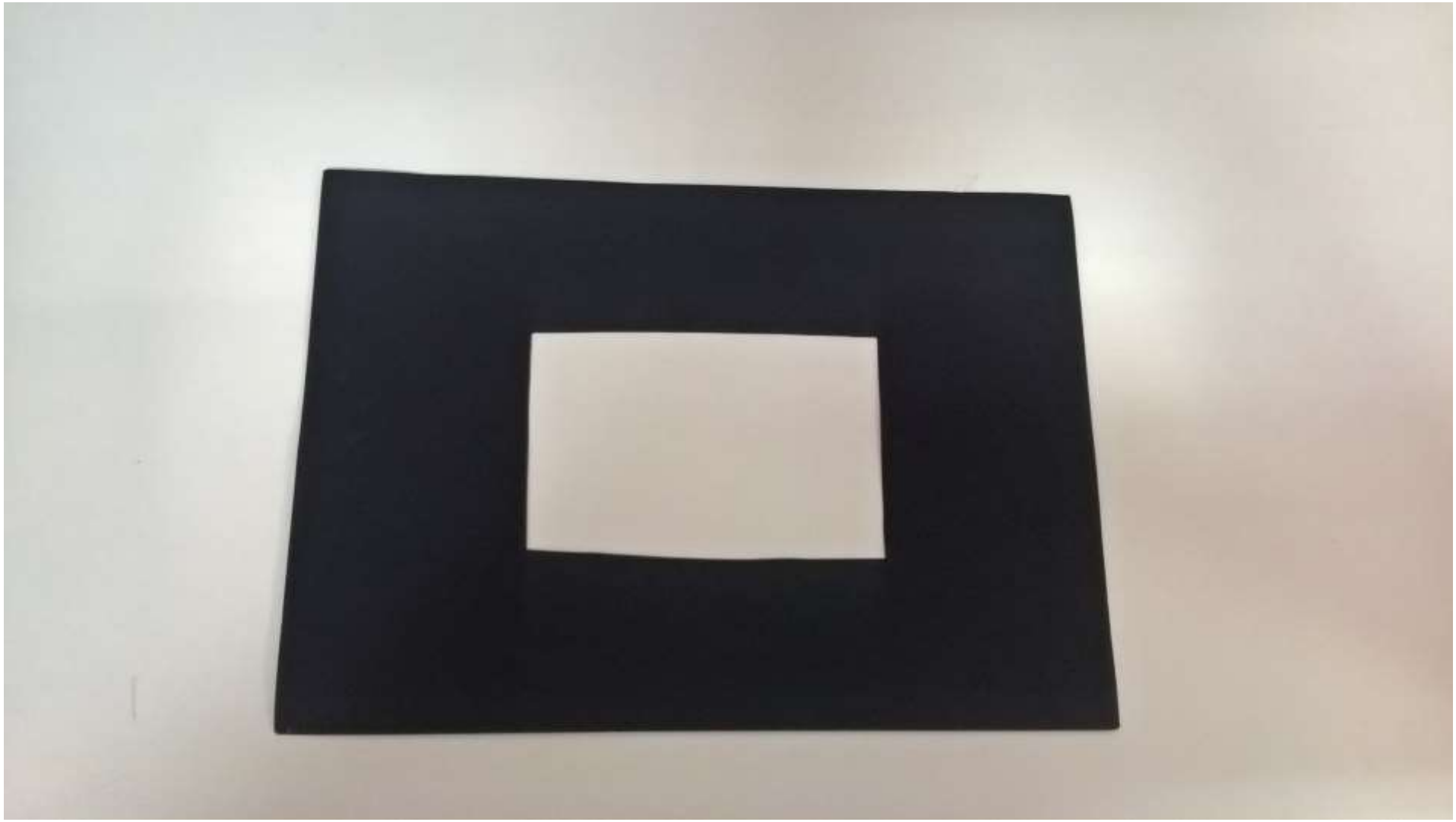

Try and complete. Label and read!
In the
In the
In the
light can't pass: it is OPAQUE
In the
In the
In the
light can partially pass: it is TRANSLUCENT
In the
In the
In the
light can easily pass: it is TRANSPARENT

4)

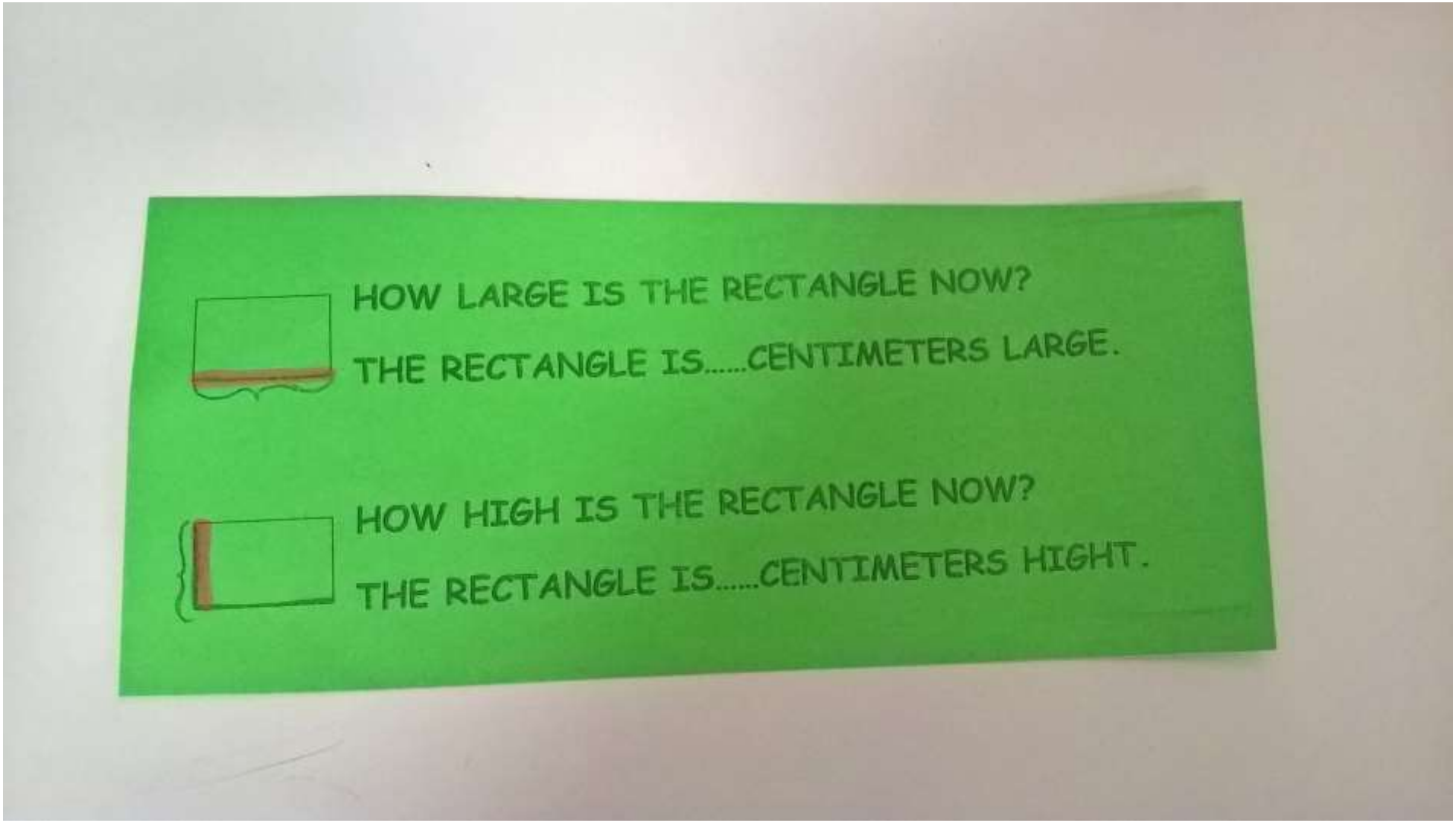

LIGHT THROUGH OBJECTS
When light shines on an object , one of three things can happen:
light
passes
through
light
passes
through
light
passes
through


Try and complete. Label and read!
In the
In the
In the
light can't pass: it is OPAQUE
In the
In the
In the
light can partially pass: it is TRANSLUCENT
In the
PLASTIC BAG
In the
GLASS
In the
GLASS JAR
light can easily pass: it is TRANSPARENT

5)



6)


HOW LARGE IS THE RECTANGLE NOW?
THE RECTANGLE IS.....CENTIMETERS LARGE.
HOW HIGH IS THE RECTANGLE NOW?
THE RECTANGLE IS.....CENTIMETERS HIGHT.

7)

	DISTANCE OF THE LIGHT FROM THE CARD	LENGTH OF THE RECTANGLE	HEIGHT OF THE RECTANGLE
COMING NEAR LIGHT	10 CM		
	25 CM		
	50 CM		
MOVING FAR LIGHT	75 CM		
	100 CM		
	150 CM		

8)

	DISTANCE OF THE LIGHT FROM THE CARD	LENGTH OF THE RECTANGLE	HEIGHT OF THE RECTANGLE
COMING NEAR LIGHT	10 CM	66	48
	25 CM	42	28
	50 CM	22	16
MOVING FAR LIGHT	75 CM	19	14
	100 CM	18	12
	150 CM	15	10