



Title:	Transparent, Translucent, and Opaque
Grade(s):	4 th
Subject(s):	Science
Author:	Brenda Daniels, Angelia Groves, Tikki Hines, Valencia Eaton Jacobs
Overview:	Students will become familiar with transparent, translucent, and opaque objects. Students predict whether items are transparent, translucent, or opaque. Student groups will create a product that demonstrates these concepts.
Content Standards:	SC(4) 3. Recognize how light interacts with transparent, translucent, and opaque materials. TC (3-5) 12. Create a product using digital tools. Content Develop an understanding of light. Standard B
Local/National Standards:	
Primary Learning Objectives:	Students will be able to recognize transparent, translucent, and opaque objects.
Additional Learning Objectives:	Students will be able to produce a complete product based on RAFT (Role, Audience, Format, Topic)
Approximate Duration of Lesson:	Two days /90 minute lessons (2 nd day may be needed to complete products)
Materials and Equipment:	For Teacher: Board & markers For Students: <ol style="list-style-type: none">1.) <i>Transparent and Opaque</i> by Angela Royston2.) Light Prediction Sheet3.) Assessment sheet4.) Bag of materials per group of 2-4 students. Include examples of transparent, translucent, and opaque materials, e.g.:<ul style="list-style-type: none">• saran wrap• wax paper• sheer fabric• white tissue paper• construction paper• astro turf• wood• plexi glass• frosted glass
Technology Resources Needed:	Computer, Internet Access, LCD projector or Promethean Board, programs (see websites listed in “Attachments”)
Background/Preparation:	Collect materials that represent each of these characteristics when they interact with light: <ul style="list-style-type: none">• Transparent – Most light rays pass through the material• Translucent – Some light rays pass through the material• Opaque – No light passes through the material
Procedures/Activities:	Step 1 a) The teacher has placed one of 3 items (a piece of wrapping paper, a clear drinking glass or candle

- holder, and a fabric softener sheet) in small group.
- b) Have students observe the characteristics of each object and how it interacts with light. Students will examine how:
- The wrapping paper does not allow light to pass through;
 - The glass or candle holder allows most light to pass through;
 - The fabric softener sheet allows only some light to pass through.
- Step 2
- a) The teacher will go over the three items (wrapping paper, candle holder, and fabric softener sheet) and how light interacts with each.
- b) The teacher will write the terms for the three types of materials on the board:
- *Transparent*- allows most light to shine through (glass candle holder),
 - *Translucent*- allows some light to pass through (fabric softener sheet),
 - *Opaque*- does not allow light to pass through (wrapping paper).
- Step 3
- a) The teacher will show students the Translucent, Transparent, and Opaque video (link below).
- b) The teacher will ask the students what the definitions of transparent, translucent, and opaque are based on what they viewed and heard from the video.
- http://www1.teachertube.com/viewVideo.php?video_id=27390
- Step 4
- a) Hold up the wrapping paper or other opaque object and ask students what happens to the light that shines on an opaque object? (Most of it is reflected back into the room and our eyes, but some of it is absorbed by the object.) Write the terms **reflected** and **absorbed** on the board.
- b) Hold up the fabric softener sheet or other translucent object and ask students what happens to the light that shines on a translucent object? (Most of the light is **scattered** by the object and then **reflected** back. Some of the light is **absorbed**, and some of it **passes through** the object.) Ask students to give evidence from their observations to support each of the explanations for what happens to light.
- c) Hold up the glass or other transparent object and ask students what happens to light that shines on a transparent object? (Most of it **passes through** the

object, but some light is **reflected** back to our eyes, which is why we can see the glass.)

- Step 5 (If time is not available, this can be assigned for homework. Students can locate every day objects that illustrate each of the levels of transparency.)
- Take a brief in-school field trip. Walk the students down the hallway, into the cafeteria, and outside the school building. Ask students to look for the different types of objects and share as they find an item that is transparent, translucent, or opaque.
 - After returning to the classroom, have students brainstorm items around the community or in their homes that are transparent, translucent, and opaque. Make a chart on the board of the different items that are transparent, translucent, and opaque.
- Step 6
- Explain to students they will be looking at different materials, which can be classified as transparent, translucent, or opaque.
 - Give a bag of materials to each group of students.
 - Students will use the Prediction Chart to predict whether each item in the bag is transparent, translucent, or opaque.
 - Students will test their predictions by holding each object up to the light.
 - On their Prediction Chart students should place a check by their correct predictions and explain what happens to the light shining on each type of object.
 - Students and teachers will discuss the results together, comparing and contrasting their results.
- Step 7 Group students into groups of four. Then, allow students time to create a product that demonstrates today's topic. Use the attached RAFT topic question and table as a guide for student projects. Students should include the words transparent, translucent, and opaque in their projects.

Attachments:

Prediction Chart

Prediction Chart Answers

Websites:

www.xtranormal.com (Movie Maker)

www.edublogs.org (Blog)

<http://learnenglishkids.britishcouncil.org/en/make-your-own> (Comic Strip Maker)

www.glogster.com (Online Poster)

**Assessment
Strategies:**

- Assess the group RAFT product for quality and accuracy.
- Have students use a magazine to locate two real world items in each category and classify on the assessment sheet as transparent,

translucent, or opaque.

Extension: Students can create an online poster using Glogster (see website list above).

Remediation: Students can be directed to the book *Transparent and Opaque* by Angela Royston. Students can read more information on the different types of objects as well as be informed of types of objects used and seen in everyday life. Students can read with the book on tape or can pair read.

RAFT Table

Topic Question: How do materials differ as they relate to absorbing light?

Role	Audience	Format	Topic
Cartoonist	Self	Cartoon strip	Transparent
Videographer	Peer group	Video	Translucent
Rapper	Music lovers	Song/lyrics	Opaque
Blogger	Bloggers	Blog	
	parents		

Name _____

Date _____

Transparent, Translucent, or Opaque Predictions

Directions:

1. Observe the following items and predict whether each is transparent, translucent, or opaque.
2. Test your predictions and explain how each item affects the light that shines on it.

ITEM	PREDICTION transparent, translucent, or opaque	Effect on Light (List main effect first)
1. Saran Wrap		
2. Wax Paper		
3. Astro Turf		
4. Sheer Fabric		
5. White Tissue Paper		
6. Construction Paper		
7. Frosted glass		
8. Wood		
9. Plexiglass		

Transparent, Translucent, or Opaque Prediction Answers

ITEM	Classification transparent, translucent, or opaque	Effect on Light (List main effect first)
1. Saran Wrap	Transparent	Pass through, reflect a little
2. Wax Paper	Translucent	Scatter, reflect, absorb, pass through
3. Astro Turf	Opaque	Reflect, absorb
4. Sheer Fabric	Translucent	Scatter, reflect, absorb, pass through
5. White Tissue Paper	Translucent	Scatter, reflect, absorb, pass through
6. Construction Paper	Opaque	Reflect, absorb
7. Frosted glass	Translucent	Scatter, reflect, absorb, pass through
8. Wood	Opaque	Reflect, absorb
9. Plexiglass	Transparent	Pass through, reflect a little