

Design rationale and accessibility narrative

Glass Scavenger Hunt handout and Engineering Toys slide deck | K-2 science, Engineering Toys unit

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Approach

I built the handout and the deck as one system, and I started from the learner. The reader here is 5 to 8 years old, still learning to read, working sometimes in print and sometimes off a projector, sometimes with a teacher reading aloud and sometimes filling in a page alone. Every decision below traces back to that reader and to the two jobs these materials do. The deck runs the lesson from the front of the room. The handout is the page a child completes on their own.

The handout is a redesign of the original Glass Scavenger Hunt. I kept its content exactly: the instruction line, the five columns (Object, color, bend, feel, strong), and all six objects in their original order (window, glass jar, glasses lens, marble, measuring cup, Activ Board screen). What changed is the design, not the science.

What was missing or non-compliant

Handout (the original Glass Scavenger Hunt):

- The title used a rough, broken “distressed” display font. Those letterforms are hard for a beginning reader to decode.
- The images mixed styles. Photographic objects (a window, a glass jar, a pair of glasses) sat next to flat clip-art symbols (a rainbow, a hammer, a hand). The brief calls this out directly, and it is a real readability problem for a young child.
- There was no brand color and almost no visual hierarchy. The page read as black line-work on white.
- Two property symbols were ambiguous. A hammer for “strong” and a maze-in-a-hand for “feel” ask a 6-year-old to read a metaphor before they can answer.

Deck:

- No consistent design. It was a Google Slides export where footers were plain text, and book covers, video screenshots, clip-art, and worksheet scans all appeared at different sizes and in different styles.
- None of the 30 images had alt text, and no slide carried an image description in the speaker notes.
- Reading order was left to the default shape order, which a screen reader follows literally.
- Contrast was inconsistent. The design-process diagram on slide 13 used five non-brand colors with thin text.
- Teacher-only instructions (“Replace these images...”) were printed on the student-facing slide.

How I resolved each

One design system across both files. TDOE navy carries the most visual weight, red is the accent, and the supporting aqua and green appear only as light fills. Open Sans is the only typeface. One motif repeats on every content slide and on the handout header: a labeled section chip with a white icon inside a colored circle.

Handout. I rebuilt the table in brand color with one row per object, large type, a name and date line, a box to draw the object's color, and the same circle choices as the original: Yes/No for bend and strong, Rough/Smooth for feel. Every object uses one icon style.

Deck. I rebuilt all 16 slides on the same system and kept every piece of lesson content and the original slide count. I kept the images that carry the content: the two book covers, the two read-aloud pages about glass and fleece, the video title cards, and the preview of the Metal Scavenger Hunt handout. I replaced the low-contrast worksheet scan on the Partner Observations slide and the off-brand design-process diagram with branded versions built from the same content. I moved the teacher setup instructions into the speaker notes, where they belong.

Image or icon

I chose icons: flat, one style, drawn in the brand palette. I did not use photographs for the objects and categories. Four reasons.

First, consistency. The brief says pick one style and hold it across the whole handout and deck. A photo of a coin next to clip-art of a hammer is the exact failure the brief warns against. A single icon set is the most reliable way to keep the handout's objects and the deck's graphics reading as one design.

Second, contrast I can guarantee. I draw every icon, so I control its colors and can meet the 3:1 graphic contrast WCAG asks for. A photo's contrast is whatever the photo happens to be. The original glass-buildings photo is a good example: mid-gray buildings against a pale gray sky.

Third, recognition. A clean, high-contrast silhouette of a window or a cup is easier for an emerging reader to name than a detailed photograph with background clutter.

Fourth, print and digital both have to work. Flat icons hold up photocopied in black and white and projected on a wall. Photographs lose detail in both.

I kept real images in one situation: when the image is the content. The book covers, the two read-aloud pages, and the video title cards point to a specific published book or a specific video, and a generic icon would lose that reference. I framed those consistently and described each one in alt text and in the notes. The rule I held: icons for anything I am representing (objects, categories, actions), real images only where the image itself is the lesson content.

I also drew every icon with a navy outline, so each shape meets the 3:1 graphic contrast on its own, whatever fill color sits inside it.

Font and legibility

The brand sheet lists Permian Slab as primary, Open Sans as secondary, and Georgia and Arial as alternates. I set everything in Open Sans, including display type, and did not use Permian Slab. The brief allows either keeping a less-legible font with a reason or swapping it and explaining. I swapped it. Here is why.

Permian Slab is a slab-serif display face. At body sizes, the serif strokes and heavy display styling make individual letters harder to tell apart, and a K-2 reader is still matching letter shapes to sounds. Open Sans is a humanist sans with open counters and clearly distinct letters, including a lowercase l that does not collapse into a capital I, which holds up for beginning readers at the sizes I used.

Open Sans is also on the brand's approved list, so the swap stays on brand. It is freely available and widely installed, so the files render the same on a classroom laptop, a projector, and a home printer. Permian Slab is a licensed font most classroom machines will not have, which brings font substitution and broken layouts on the exact devices these files run on.

If TDOE wants Permian Slab for brand recognition, the safe place for it is the large title only: one word at a large size, where letter-level legibility is not at risk. I would keep all body and table text in Open Sans.

Sizes. Handout body and table text run 13 to 15 point, with object names bold. Deck titles are 34 point, body text 18 to 22 point, and captions 11 to 12 point. Everything a child reads is well above small-print size and sized for both a young reader up close and a projector across the room.

ADA compliance

This was a design pass, so I focused on what a designer controls: contrast, alt text, image descriptions, reading order, and type.

Contrast. I checked every text-and-background pair and every graphic against WCAG 2.1 AA (4.5:1 for body text, 3:1 for large text and graphics) using the standard relative-luminance calculation. The combinations I shipped and their measured ratios:

Text / background or graphic pair	Measured ratio
Navy #002D72 text on white	12.98 : 1
Dark gray #3D3E40 body text on white	10.71 : 1
Blue #174A7C text on white	9.10 : 1
Red #D22730 text on white	5.16 : 1
Gray #767676 (captions and footers only) on white	4.54 : 1
White text on navy / blue / red / teal	12.98–4.71 : 1
Dark gray #3D3E40 on aqua #2DCCD3 fill	5.45 : 1
Dark gray #3D3E40 on green #D2D755 fill	6.93 : 1

The rule I followed to stay safe: the light supporting colors (aqua, green, orange) never carry white text and never act as text themselves. They are fills behind dark text, or outlined shapes. White on orange measures 2.96:1, so I never used it, including on the numbered steps of the design-process slide, where I used the five brand colors that clear the threshold with white type. The brand sheet's own disclaimer says the palette is not contrast-guaranteed and the user has to verify it. I verified it, and I would still run these through the WebAIM checker the sheet links to before publishing.

Alt text. Every image in the deck (30 total) and every image in the handout carries alt text. Representational icons get a short description. Content images, such as the book covers and read-aloud pages, get a fuller description of what is shown.

Image descriptions in the notes. Every slide that has an image includes a plain-language description of that image in the speaker notes, along with the video links and the teacher setup notes.

Reading order. On every slide, the shapes are added in reading order, so assistive technology moves through the section chip, then the title, then the body, then the image, then the footer.

Font size and legibility are covered in the section above.

Files

- **Glass_Scavenger_Hunt_Handout.docx**: the redesigned handout
- **Engineering_Toys_Deck.pptx**: the redesigned 16-slide deck
- This narrative

NAME: _____

DATE: _____

Glass Scavenger Hunt

Observe each object. Draw the color of the object. Circle your choices.

Object	color 	bend 	feel 	strong 
window 		Yes No	Rough  Smooth 	Yes No
Glass jar 		Yes No	Rough  Smooth 	Yes No
Glasses lens 		Yes No	Rough  Smooth 	Yes No

Object				
--------	--	--	--	--

	color 	bend 	feel 	strong 
Marble 		Yes No	Rough  <u>Smooth</u>	Yes No
Measuring cup 		Yes No	Rough  <u>Smooth</u>	Yes No
Activ Board Screen 		Yes No	Rough  <u>Smooth</u>	Yes No



Glass Scavenger Hunt

Name: _____

Date: _____

Observe each object. Draw the color of the object. Circle your choices.

 Object	 Color	 Bend	 Feel	 Strong
 Window		Yes No	Rough Smooth	Yes No
 Glass jar		Yes No	Rough Smooth	Yes No
 Glasses lens		Yes No	Rough Smooth	Yes No
 Marble		Yes No	Rough Smooth	Yes No
 Measuring cup		Yes No	Rough Smooth	Yes No
 Activ Board Screen		Yes No	Rough Smooth	Yes No



Engineering Toys

Lesson 1 · What types of toys do kids play with?

Tennessee K-2 Science

?

ASK

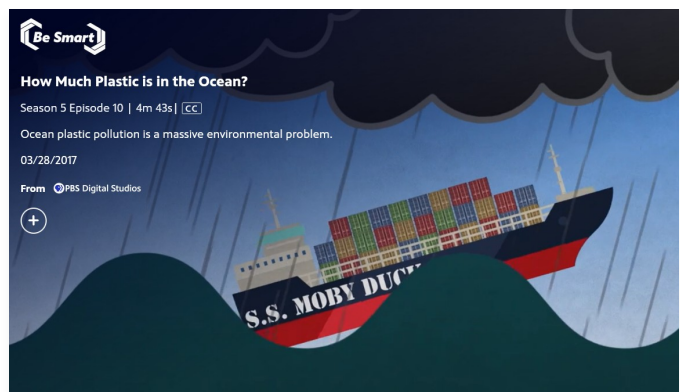
Puzzling Phenomenon



Watch the video

How Much Plastic Is in the Ocean?

PBS Be Smart · 4 min 43 sec





ASK

Unit Driving Question



How can we make toys from recycled and reused materials to reduce waste?



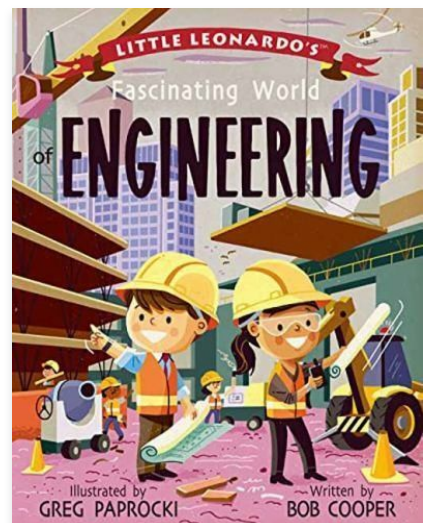
READ

Read Aloud

Little Leonardo's Fascinating World of Engineering

written by Bob Cooper · illustrated by Greg Paprocki

Read the book together and talk about what engineers do.





WRITE

Lesson Question

What types of toys do kids play with?

Write or draw your answer:



EXPLORE

Partner Observations

Watch your partner play with a toy. What is it made of? How does it work?

Draw what you see



Look closely!
Use your eyes and hands
to explore the toy.



SYNTHESIZE

Summary Table

Lesson Question: What types of toys do kindergarteners play with?

What claims can we make about what we figured out?

How did we figure that out? What is our evidence?



EXPLORE

Toy Sorting

Sort the toys into groups by what they are made of.

Glass

Metal

Plastic

Fabric





READ

Read Aloud

Touch It! Materials, Matter, and You

written by Adrienne Mason

Read together and notice the materials all around us.



SYNTHESIZE

Summary Table

Lesson Question: How can we sort toys in different ways?

What claims can we make about what we figured out?

How did we figure that out? What is our evidence?



EXPLORE / WRITE

Metals

Go on a Metal Scavenger Hunt. Find metal objects and describe each one.

NAME _____ DATE _____

Metal Scavenger Hunt

Observe each object. Draw the color of the object. Circle your choices.

Object	color 	bend 	feel 	strong 
Paperclip 		Yes No	Rough Smooth	Yes No
Coin 		Yes No	Rough Smooth	Yes No
Chair leg 		Yes No	Rough Smooth	Yes No

Engineering Toys · Lesson 3 · Explore / Write

Object	color 	bend 	feel 	strong 
Aluminum foil 		Yes No	Rough Smooth	Yes No
Metal car 		Yes No	Rough Smooth	Yes No
Metal spoon 		Yes No	Rough Smooth	Yes No



WATCH

How Steel Is Made



Watch the video

See how steel is made from melted metal, then talk about how people shape metal.





SYNTHESIZE

Using the Design Process

1

Find a problem

2

Brainstorm solutions

3

Plan and make a model

4

Test and improve

5

Communicate

Think: How could we use metal in our design of a toy?

Adapted from Engineers Solve Problems by Reagan Miller and Crystal Sikkens, pp. 12-13.

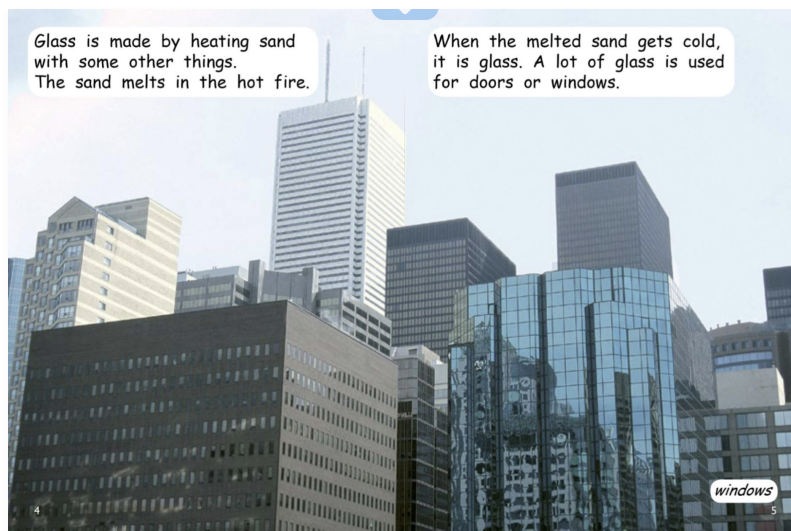
Engineering Toys · Lesson 3 · Synthesize

13



READ

What Is Glass Made Of?

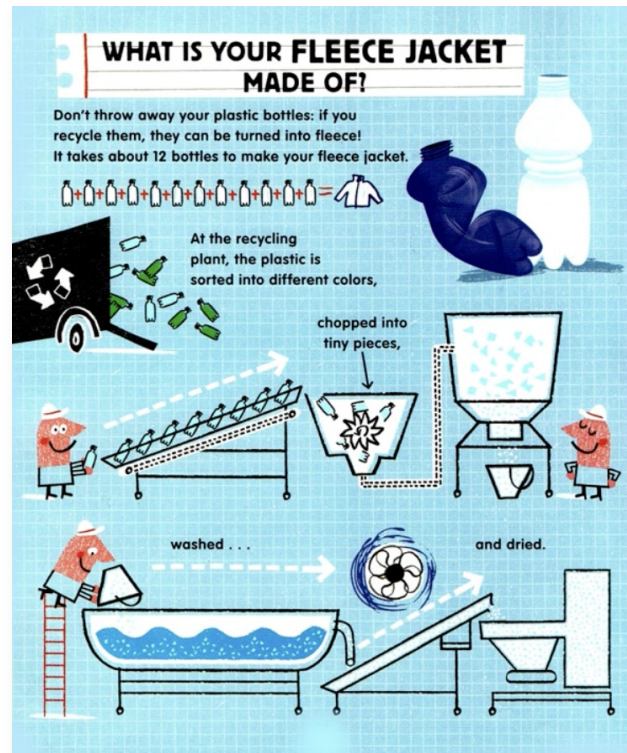


Engineering Toys · Lesson 3 · Read

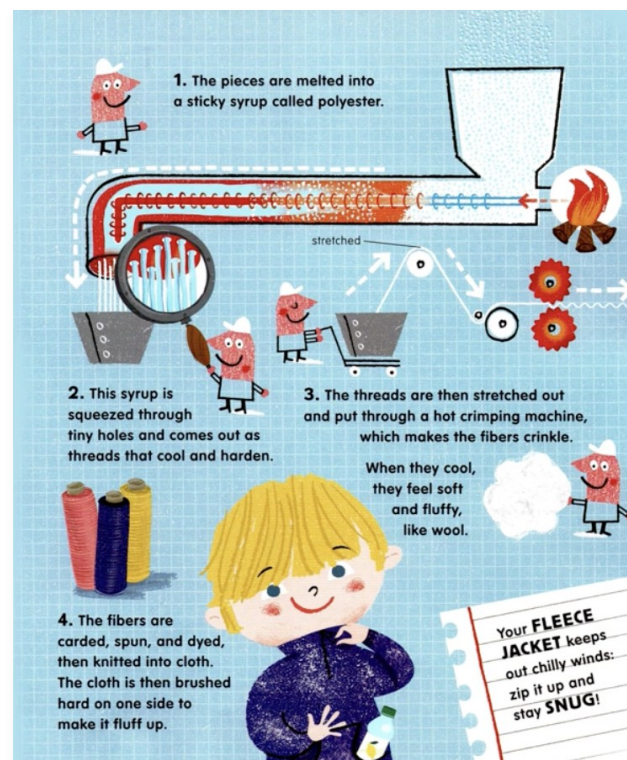
14



What Is Your Fleece Jacket Made Of?



From Bottle to Fleece



State-Approved Logos, Colors, & Typefaces

Please refer to Tennessee's State Brand Identity Guidelines for complete usage information.

Logos



Primary - Color

This logo should be the default for all digital and color printing applications.

Color Reverse/ Grayscale/Reverse & Black/White

When printing the logo on dark or vivid backgrounds, use the color reverse logo. This is the preferred logo usage on dark backgrounds and over photography. When color is not available, use the grayscale logos. Alternatively, some situations may require the solid black or solid white logo.

Colors Palettes

Primary - State of TN Colors

Red, navy, and gray should be given prominence, with the supporting palette colors reserved for accents.

DIGITAL

Red



RGB: 210/39/48
Hex #: D22730

Blue



RGB: 23/74/124
Hex #: 174A7C

Navy



RGB: 0/45/114
Hex #: 002D72

Gray



RGB: 118/118/118
Hex #: 767676

PRINT



Pantone: 1795C
CMYK: 0/96/82/1



Pantone: 4153C
CMYK: 100/76/25/9



Pantone: 288C
CMYK: 100/79/0/37



Pantone: Cool Gray9C
CMYK: 50/40/34/17

Supporting Palette (to be used as primarily as accents)

DIGITAL

Aqua



RGB: 45/204/211
Hex #: 2DCCD3

Green



RGB: 210/215/85
Hex #: D2D755

Orange



RGB: 232/119/34
Hex #: E87722

Teal



RGB: 93/121/117
Hex #: 5D7975

PRINT



Pantone: 319C
CMYK: 60/0/16/0



Pantone: 584C
CMYK: 17/0/75/0



Pantone: 158C
CMYK: 0/62/97/0

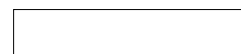


Pantone: 5487C
CMYK: 61/32/39/21

Disclaimer

The colors provided on this page are generic branding-approved colors. This page is not intended to provide color and font contrast guidelines to meet accessibility standards. Users are responsible for checking background color and font contrast to ensure compliance with WCAG 2.1 AA standards. They are also responsible for verifying that their designs meet all applicable accessibility requirements and for conducting appropriate testing to ensure usability for individuals with disabilities. **Note: Users can validate their color contrast for ADA compliance at [WebAIM web accessibility website](#).**

Grayscale



Hex #: FFFFFFFF



Hex #: E0E0E0



Hex #: D1D3D4



Hex #: A7A9AC



Hex #: 3D3E40 (Font)



Hex #: 000000 (Font)

Typefaces

Primary
Permian Slab

Secondary
Open Sans

Alternates
Georgia
Arial