

# Chemistry Project 3

*Chemical Reactions*

*Ivy Hall Academy*

*February 2023*



# Choice of Topics

- **Types of reactions:** Descriptions and examples of the five types of chemical reactions and their patterns and predicting products when given reactants.
- **Balancing reactions:** Steps and examples of writing balanced chemical equations, including their parts and symbols.
- **Stoichiometry:** If given the grams of one reactant, how do you calculate the grams needed or expected for the other chemicals in a reaction?
- **Limiting reactants:** If given so many grams of one reactant and so many grams of another, which one will be used up first?



# Choice of Software and Project Type

- Look at the PDF file attached to this assignment in Alma. It lists software categories and has project description summaries.
- Look at <https://science-creativity.com/projects> for detailed project descriptions and examples.
- Look at <https://science-creativity.com/software-training> for videos on how to use the software.

## A Choice Board for Using Browser-Based Media Design Software to Demonstrate Mastery of STEM Concepts

See <https://science-creativity.com/projects> for detailed descriptions, examples, and grading rubrics for each type of project and <https://science-creativity.com/software-training/> for instructional videos on how to use the software.

The following table has brief descriptions of some possible projects that could be done in each concept category and for different types of software and projects. This is not an exhaustive list – the types of projects possible are only limited by your imagination. You can choose one of these or propose your own idea, but it does need to incorporate digital media production, demonstrate your mastery of the STEM concept you are presenting, show high levels of creativity and quality, and have the ability to teach other students about your topic.

Media Mode/ Software	Project Type	Project Descriptions
<i>Photospe or Inkcape</i>	Comic Book or Graphic Novel	Draw the boxes, characters, scenery, and talk balloons by hand with pencil, then ink in the lines, erase the pencil, and photograph the pages. Clean up the pencils in Photospe, then use the Coloring Line Art video under Photospe to learn how to add color, scenery, and text to your lines.
<i>Image creation using pencil (Photospe) or vector (Inkcape)</i>	Collage or Scrapbook	Combine a series of photographs together inside Photospe by placing each one on its own layer, carefully selecting the edges using the QuickMask tool, and adding Layer Masks, drop shadows, vignettes, and other features as shown in the Isolating Images with Layer Masks video under Photospe. This can be used for making collages, scrapbooks, cover designs, photo essays, and more.
	Flip Book or Pop-Up Book	Using Photospe, you can design the parts of a pop-up children's book. You will need to look at examples to see how the parts are folded and glued onto the main page so that they will neatly fold up and unfold as the pages are opened and closed. Then trace the outlines, folds, and tabs as designed in Photospe, they can be colored, printed, and assembled.
	Technical Diagrams or Illustrations	A technical illustration of a diagram is an excellent way to demonstrate your understanding of a machine, process, or network of ideas. Inkcape and Photospe can both be used with the Type and Line tools to make shapes and show connections. For example, you could create a concept web or show the steps in a process. Place the different types of design elements (lines, shapes, text) on separate layers so that they can be moved and resized as needed. Use the Magic Wand to select areas and add colors. If you expand the selection by a pixel or two, then move to a new upper layer and fill the selection with color, you can set the layer blending mode to Darken and avoid any gray pixels around the edges.
	Illustrated Lecture Notes or Book Report	Some students have neat handwriting and take notes that are a work of art, with doodles and decorations. You can create a project to demonstrate your mastery of the concepts by using Photospe to clean up and add photographs, to your notes along with images, diagrams, and computer text to your notes.
	Blog Post w/ Images	If your teacher has a blog site you might slip easily into a topic by writing your own blog post for the site, including finding images or illustrations, creating and laying out the post, and adding captions. Not only will you learn some web-design principles and HTML, you will be sharing your knowledge with other people around the world.
<i>Easel.ly, Canva, PhotoChart or Thinglink</i>	Infographic or Linked Poster	An infographic is a poster on scrolls. It includes data, charts, graphs, images, text, and is nicely designed and laid out to be eye-catching and informative. Using online infographic software such as Easel.ly or PhotoChart, you can add the components of your research into an infographic. Canva also has templates. Thinglink allows you to add pop-up captions, web links, and even video clips to create an interactive poster.
<i>Desktop Publishing (DTP) and layout design</i>	Brochure	Using both sides of a single sheet of 8.5 x 11 inch paper folded into thirds, you can use Canva to layout a brochure. It could be a travel advertisement for a planet, a brochure on careers in chemistry, or any other STEM topic. The first panel is at the right on the outside page and introduces the topic with an eye-catching image and simple text. The 11 panel is

# Examples of Projects

➤ Here are some examples of project types and student work:



Create a “talking head” narrator in Voki



Film a fake news broadcast or mockumentary

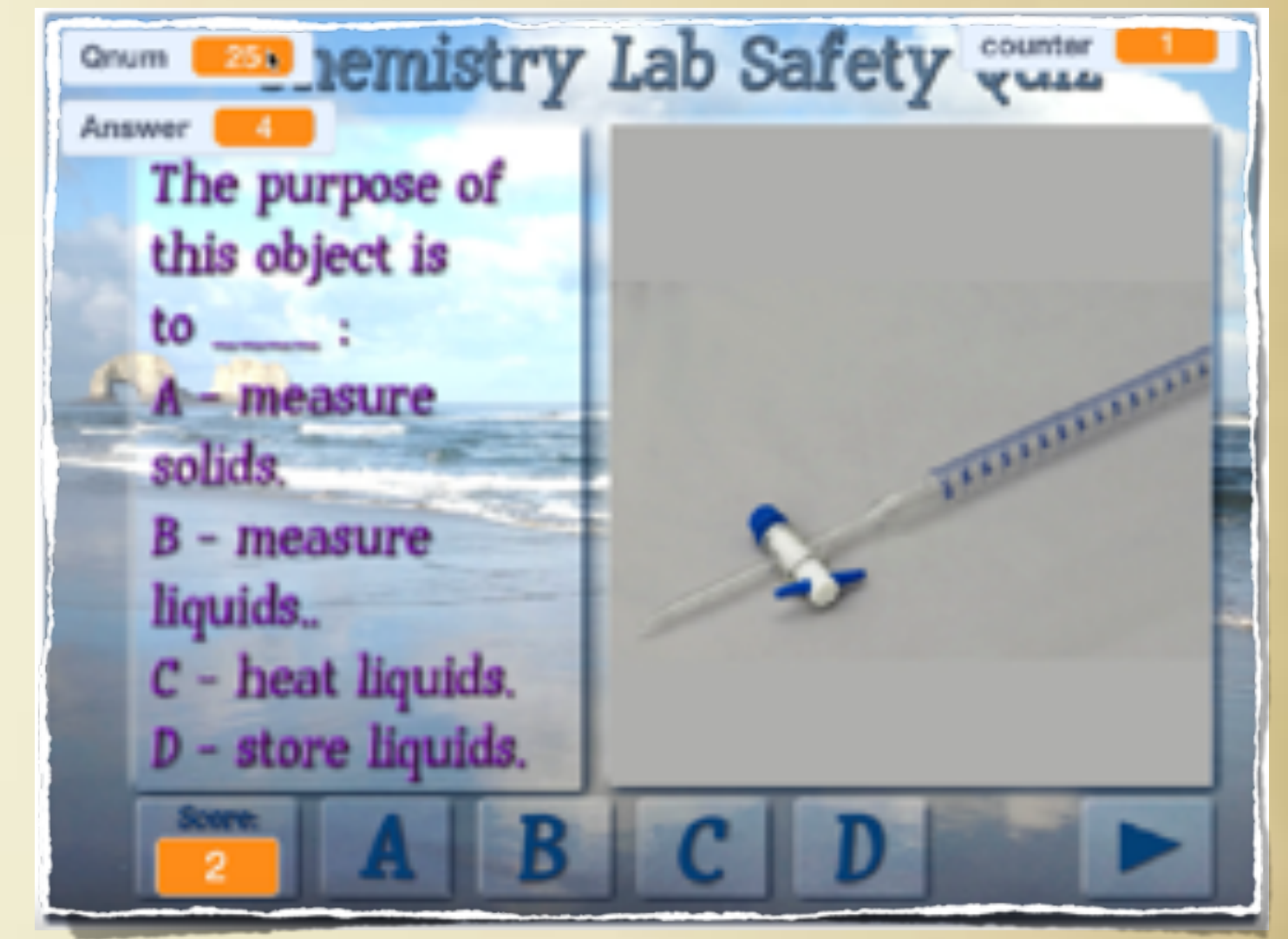
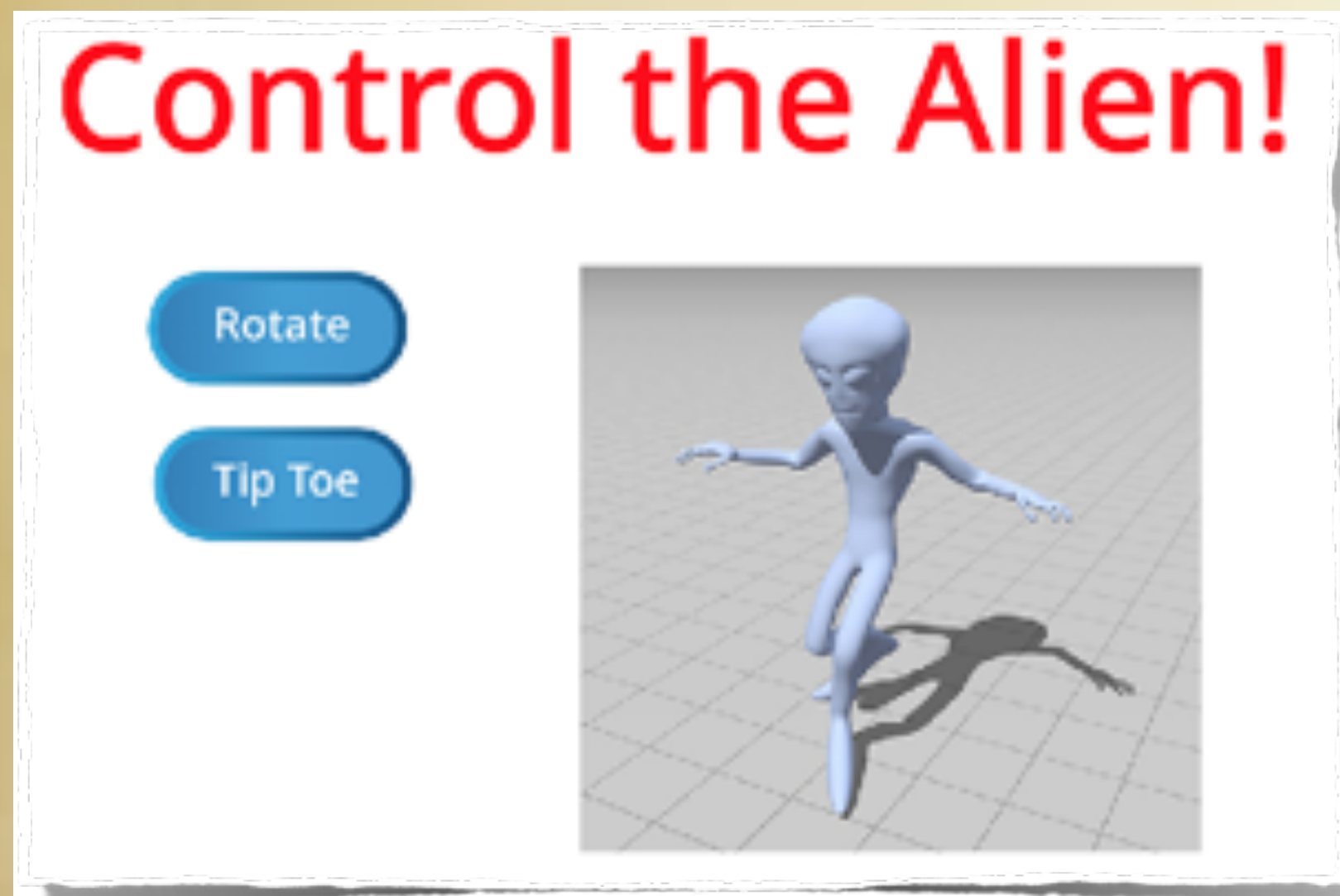


Build a Public Service Announcement

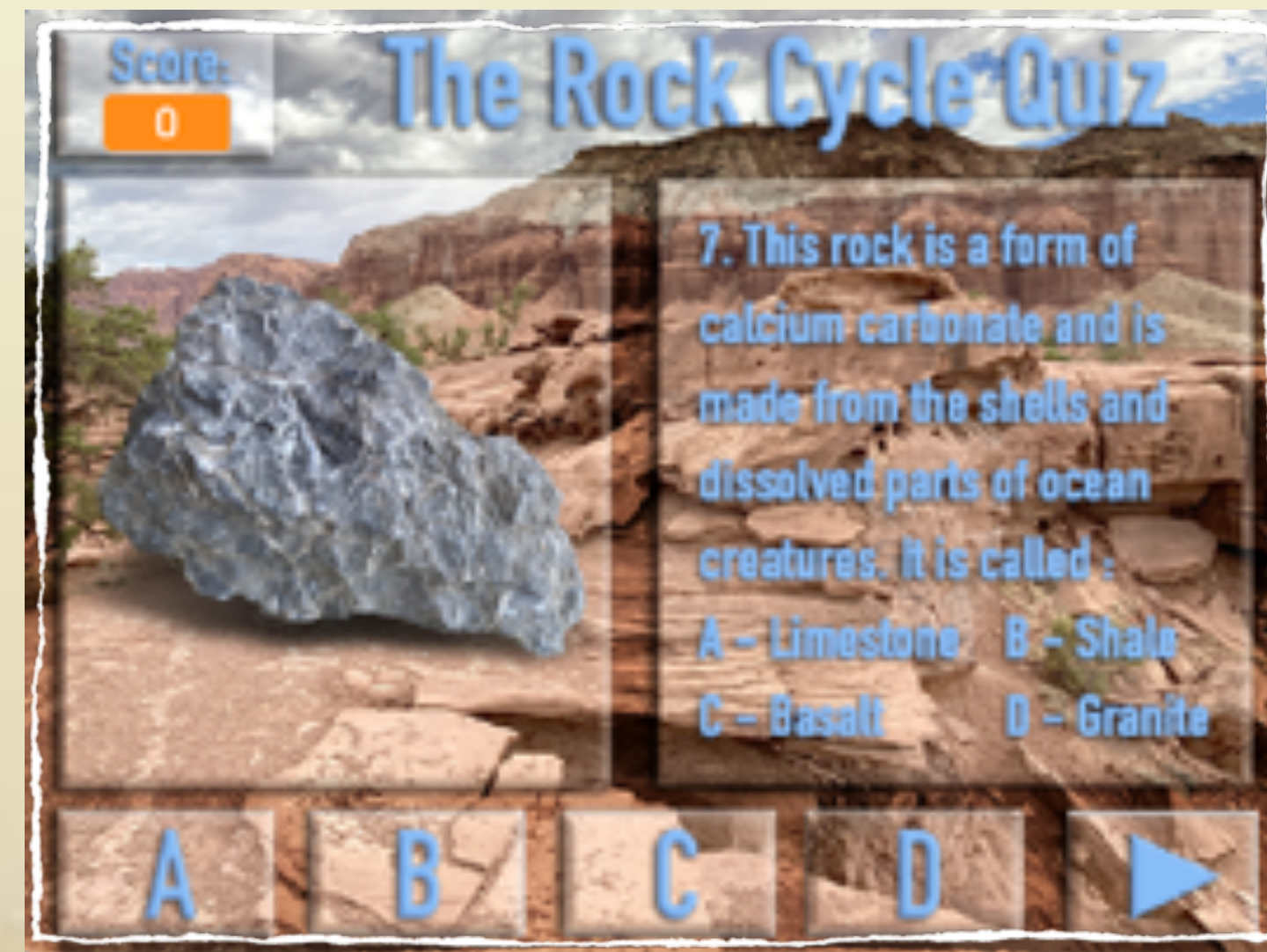


Model an AR scene

# More Examples



Program a game or quiz in Scratch




Create an audio podcast



# Still More Examples

## AD ASTRA PER EDUCARE

THE ASTRONOMY MAGAZINE OF  
NEW HAVEN SCHOOL



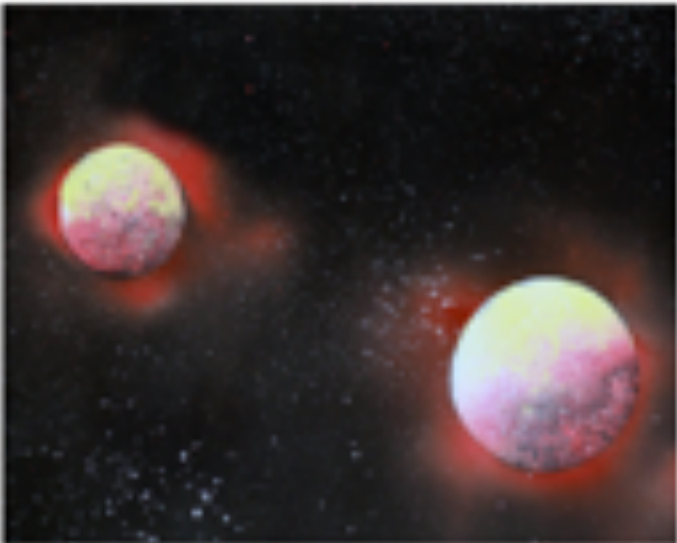
**Vol. 2 No. 2 (August, 2021): The Nearby Stars and Exoplanets**

**I Have Loved the Stars**  
 Editorial by David Black

My first planetarium software was an old black and white program that ran on a Macintosh Classic computer. I have tried to find a reference for it, but can't remember its name. As a physics teacher at Jush High School in the small farming town of North, Utah I had access to a 10" reflecting telescope on a heliostatic equatorial mount with a barn's exit mirror. I set up a few evening star parties for students and used the old software to find the locations of the planets and interesting stars and nebulae. We had to move the scope by hand, but it worked all right.

While at Jush High School, as I was working through a unit on astrophysics I came up with a wild idea to have students create a model of the nearby stars out to 15 light years. I had heard of Alpha Centauri (I grew up watching the original *Lost in Space*) and had read enough science fiction to know that *The Core* and *Twilight* (I think) were also nearby stars, but that was about the extent of my knowledge. It became a research quest of mine to

find a table of the nearby stars. I searched my old college astronomy textbooks and it had a table of the brightest stars, but not the closest, although it did list some of them such as Sirius. I looked in university libraries and began to piece a list together. Now this was 1993, and the Internet, as we know it, now was only beginning. In fact, Tim Berners-Lee developed the World Wide Web system with hypertext about that time, so research had to be done the old way, using the Dewey Decimal System and library index cards.



*This complements painted by Sammi using spray paint.*

I finally put together a moderately complete list and developed my own lesson plan activity. Our first attempt used a large aquarium ball in the center and the stars were beads glued on wooden skewers pointed into the ball. Measuring the right ascension and declination was difficult, and the final model was not very accurate or complete. The next year my lesson improved - we hung the stars from the ceiling with black bulletin board paper behind and strips of tape for the *Great Equinox* and *Central Equinox*, using a primitive sensor to get the

**Table of Contents:**  
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**Additional Activities**


We will be taking a day trip to Saturn's moon, Enceladus. There, you can surf on the enormous waves, or you can climb the ice mountains! Or simply just enjoy the scenery.

We will also be taking a space walk along the rings of Saturn. Just be careful not to fall off. They aren't made of much.

We will also go

will be surfing on the surface of the planet. literal wind surfing on the wind. no water!

SATURN!



Lay out a brochure

**Here's Some Interesting Facts**

Saturn is the least dense planet in the solar system and would actually float if you could find a body of water large enough.

Saturn has 60 moons, some just a few km across.

an average day on the planet of Saturn is about 10 and a half hours.

Sometimes, Saturn's rings seem to disappear.

**Transportation**


We will be taking a state of the art first class space craft. Fully furnished and equipped with enough supplies to keep 500 people alive for up to 7 years! Space suits will be provided for all those aboard in case of an emergency. The route will take us past all of the most spectacular sights in all of the solar system! It will take a while to get there so, the option to be

be provided to all those who request it beforehand.

**Living Quarters**

We will be staying in an all expenses paid, 5 star hotel. Hotel Intergalactic. there will be complimentary room service all day long and only first class rooms for all!

**Hotel Intergalactic!**



Design a newsletter

### Brochure Layout and Flow

Inside Page 8.5" x 11"

B	F	A
This panel takes the message one step further with a short introduction or a brief list of attributes.	This panel is for contact information or return address for a self-mailer, or for parenthetical information.	This panel needs to catch the reader's attention with a bold image and short statement about the topic.
Outside Page 8.5" x 11"		
C	D	E
These 3 panels are for providing detailed information on the topic with words wrapped around images and flowing from box to box as shown	here. The goal of the outside page and Panels A and B is to entice the reader to open up the brochure and read the details inside. The inside page	must provide a convincing case for finding out further information by going to the website or calling the phone number listed in Panel F.


# Yet More Examples

I believe in

- Project-based learning
- Mastery-based assessment
- Students as:
  - scientists
  - engineers
  - inventors
  - content creators
  - coders
  - makers
  - innovators

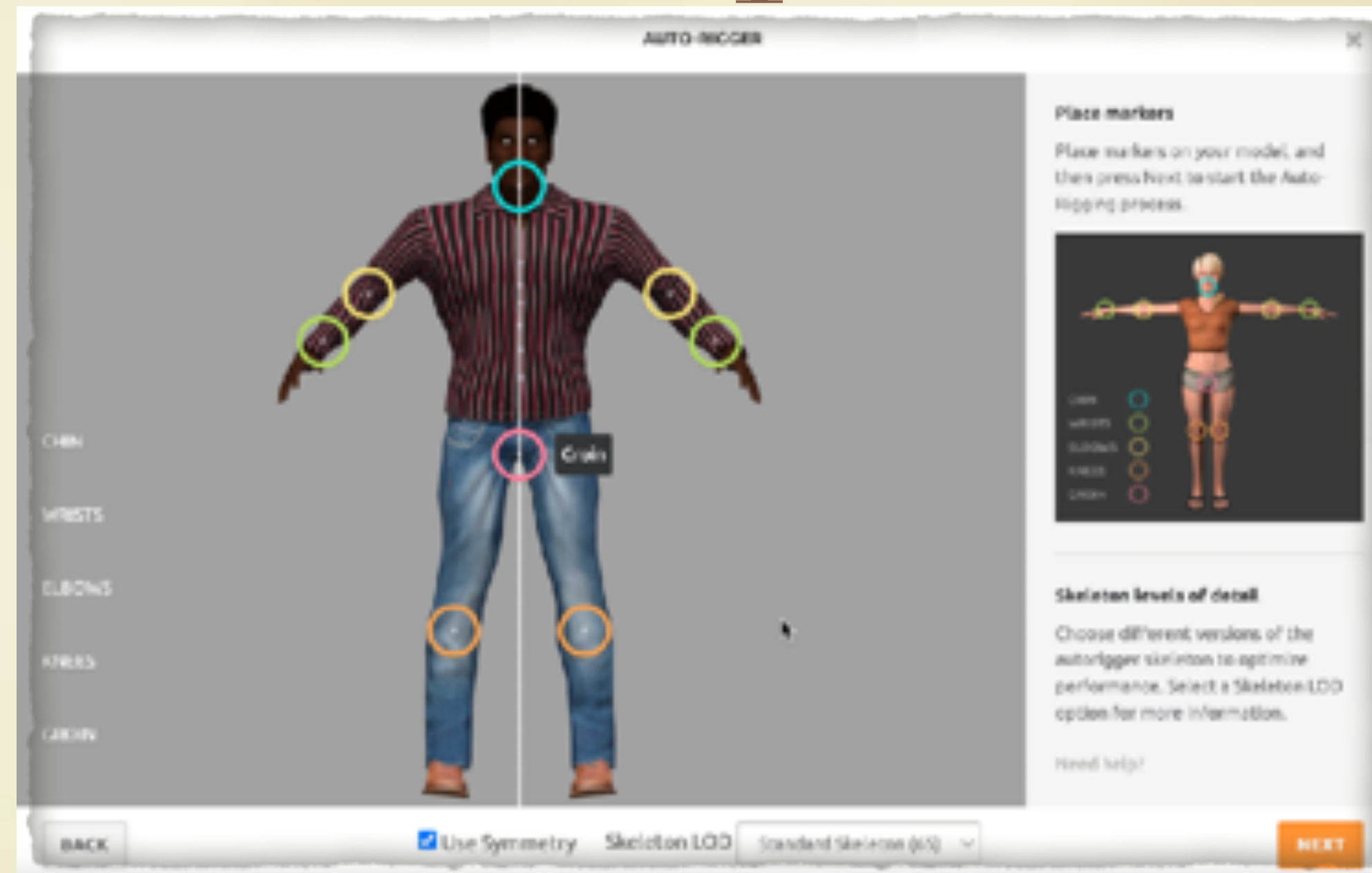
My students demonstrate their learning through

## Amazing Projects

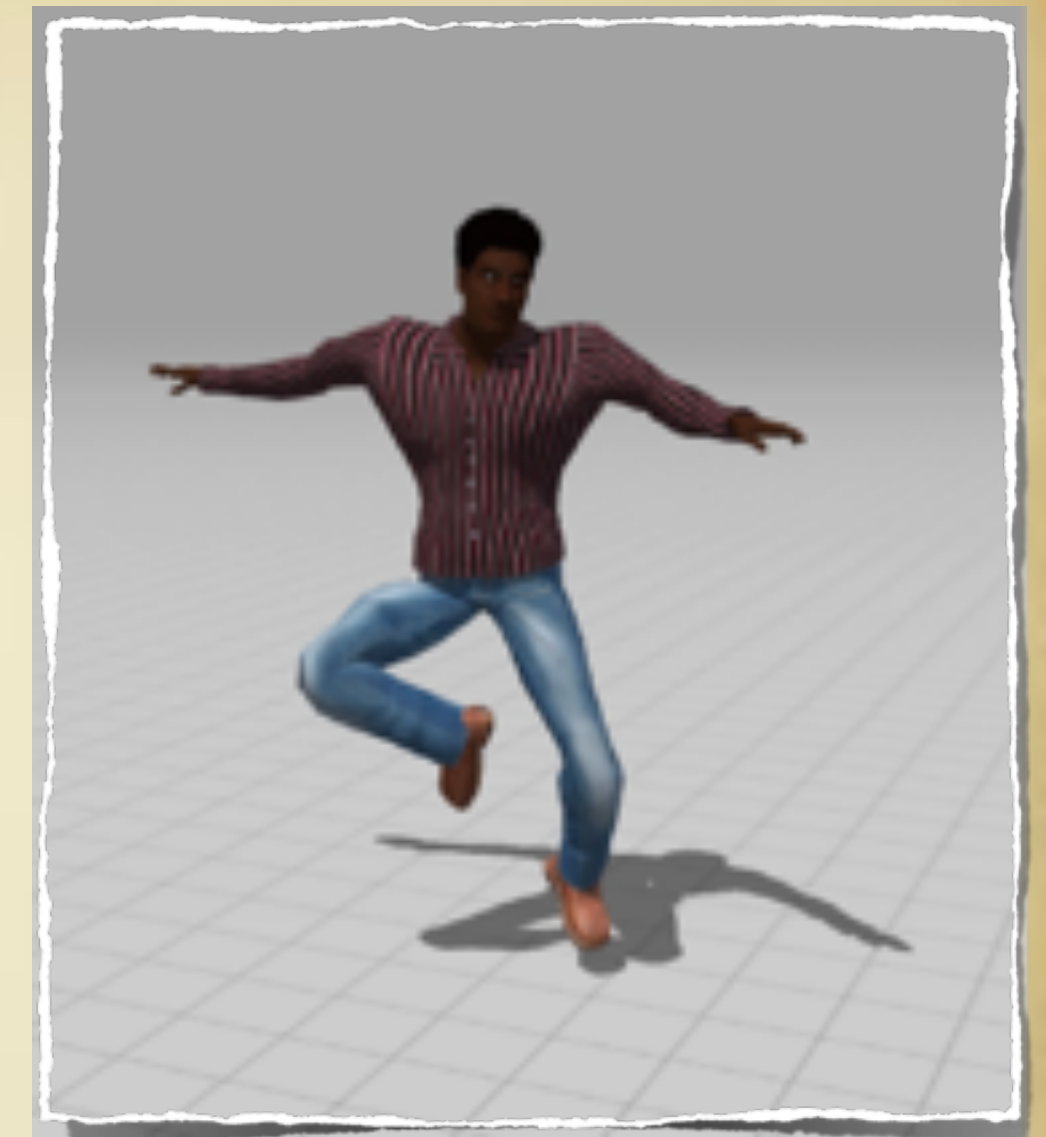
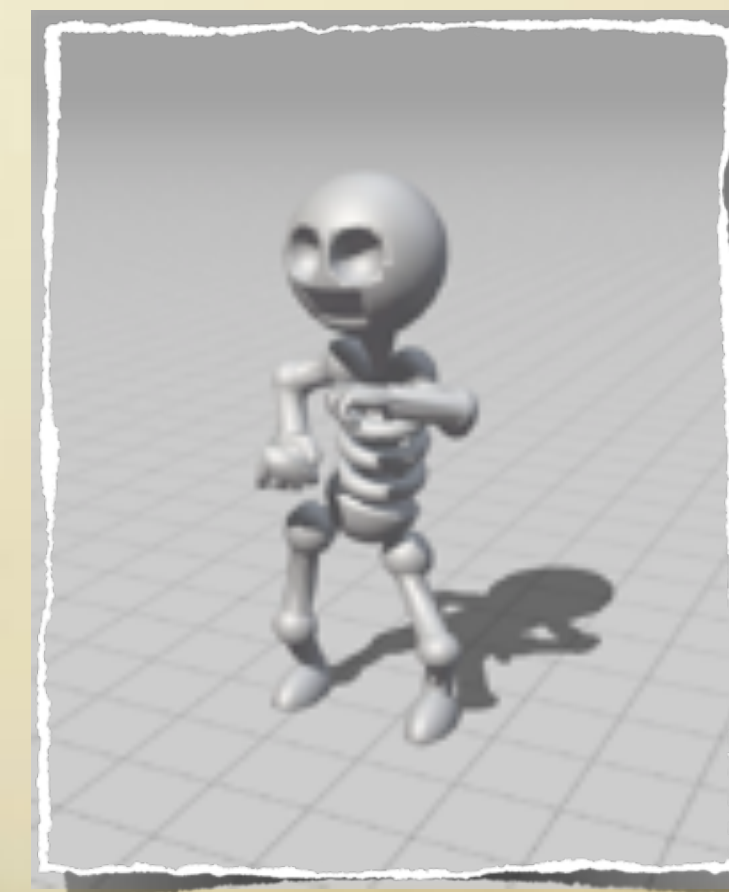


Made with Animaker

Make an animated presentation in Animaker or Powtoons



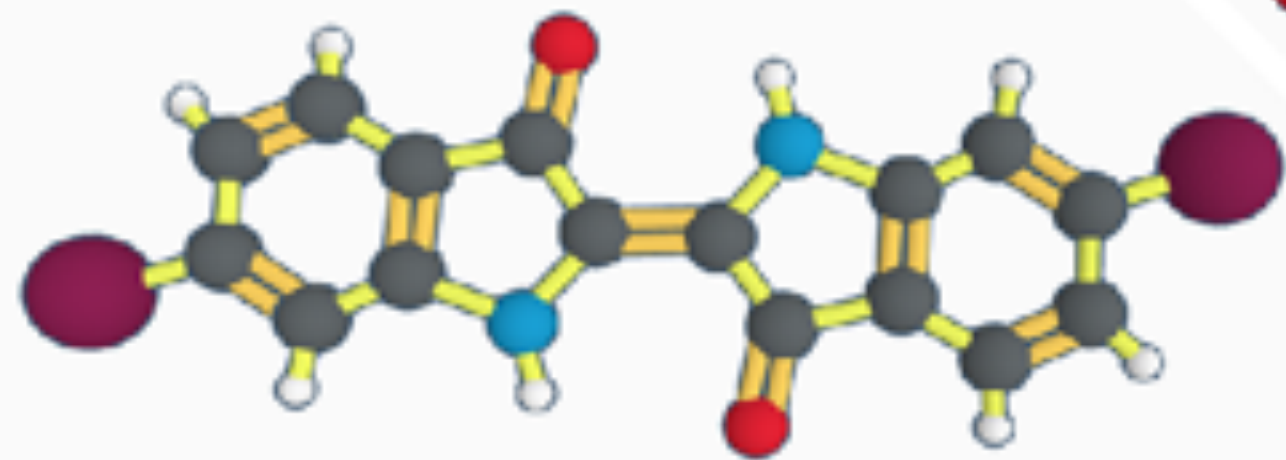
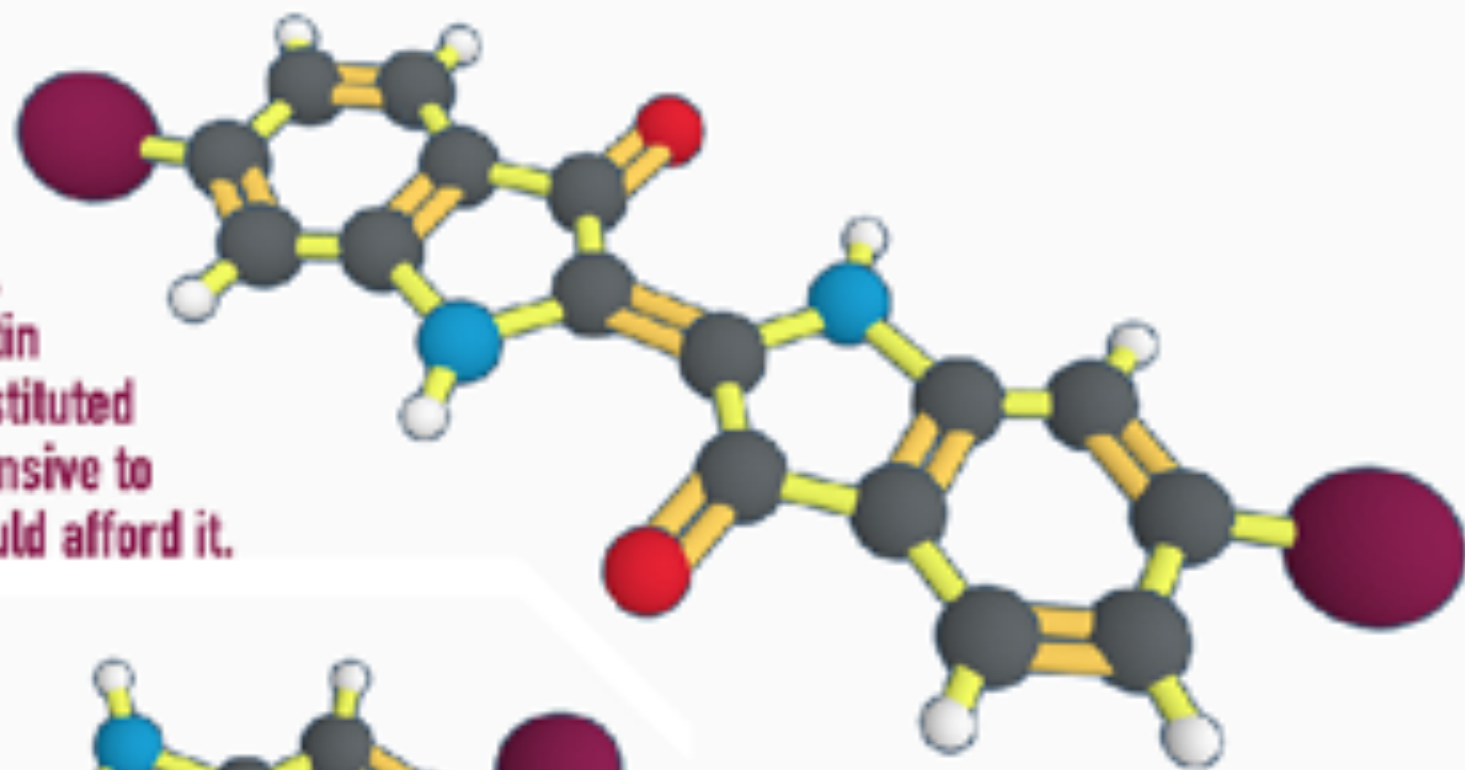
Model characters in Make Human or Sculptris or Tinkercad, then rig and animate them in Mixamo.



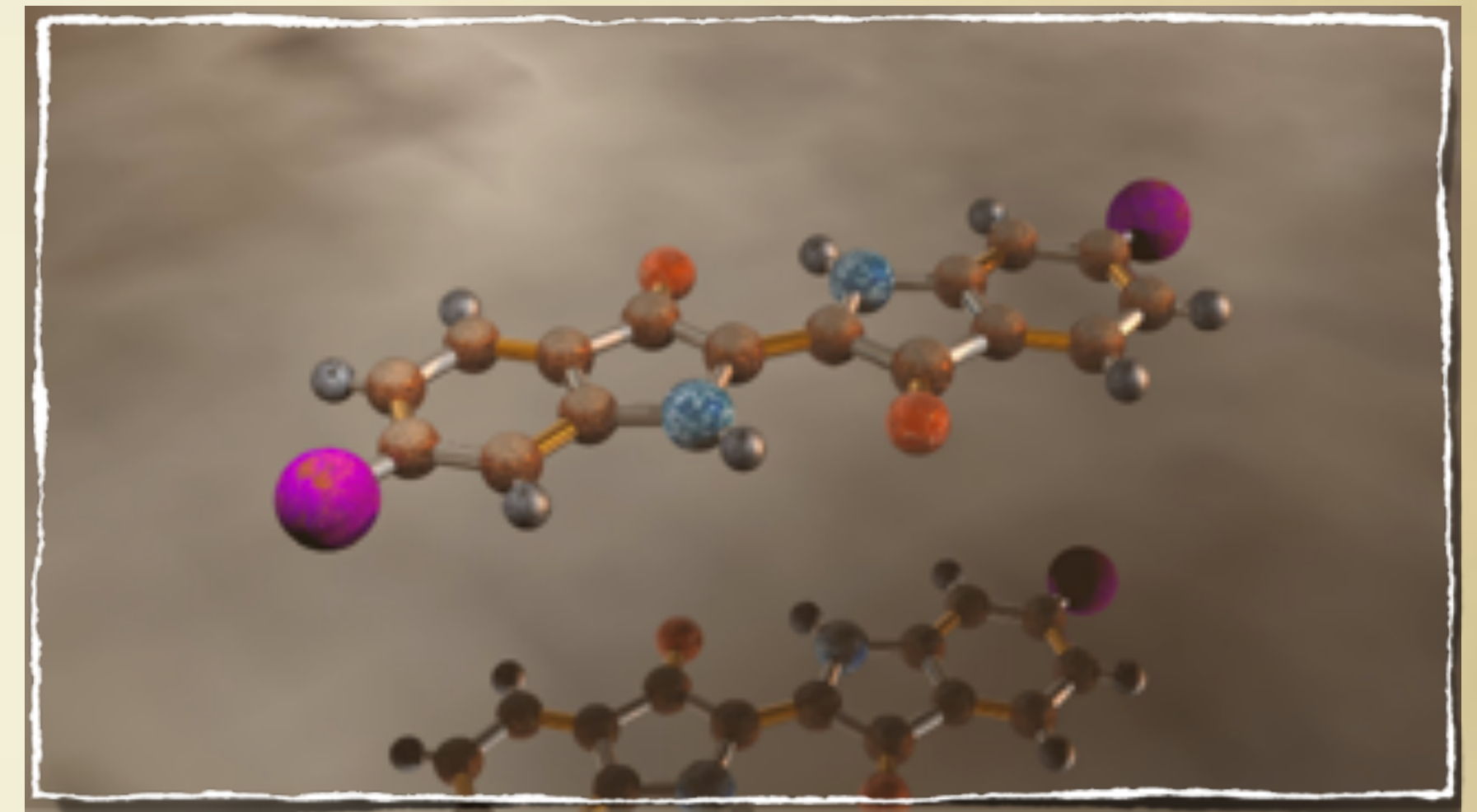
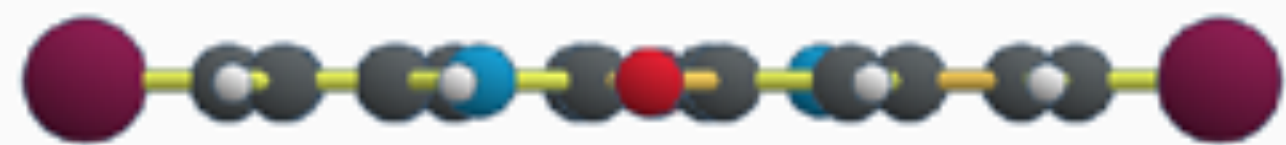
# And other examples . . .

## Tyrian Purple

Extracted from the Murex sea snail, this natural dye is similar to indigotin except two bromine atoms are substituted for hydrogen atoms. It was so expensive to extract that only Roman nobility could afford it.



This molecule is also remarkable for being planar and symmetrical. It is named after the Phoenician city of Tyre on the coast of Palestine, where the dye was extracted.



Build a 3D molecule or reaction in Tinkercad, then use Photopea to add text describing the reaction.

Build a cartoon strip in MakeBeliefsComix or StoryBoardThat





# Grading Rubric

- This project will be worth 50 points total.
- 25 points based on daily reflection logs.
- 25 points based on peer/teacher critique forms.
- It must show five characteristics:
  1. Demonstrates mastery of science concepts (chemical reactions),
  2. Shows creativity,
  3. Displays high quality and effort,
  4. Achieves proficiency with using media design software, and
  5. Effectively teaches peers about the concept.

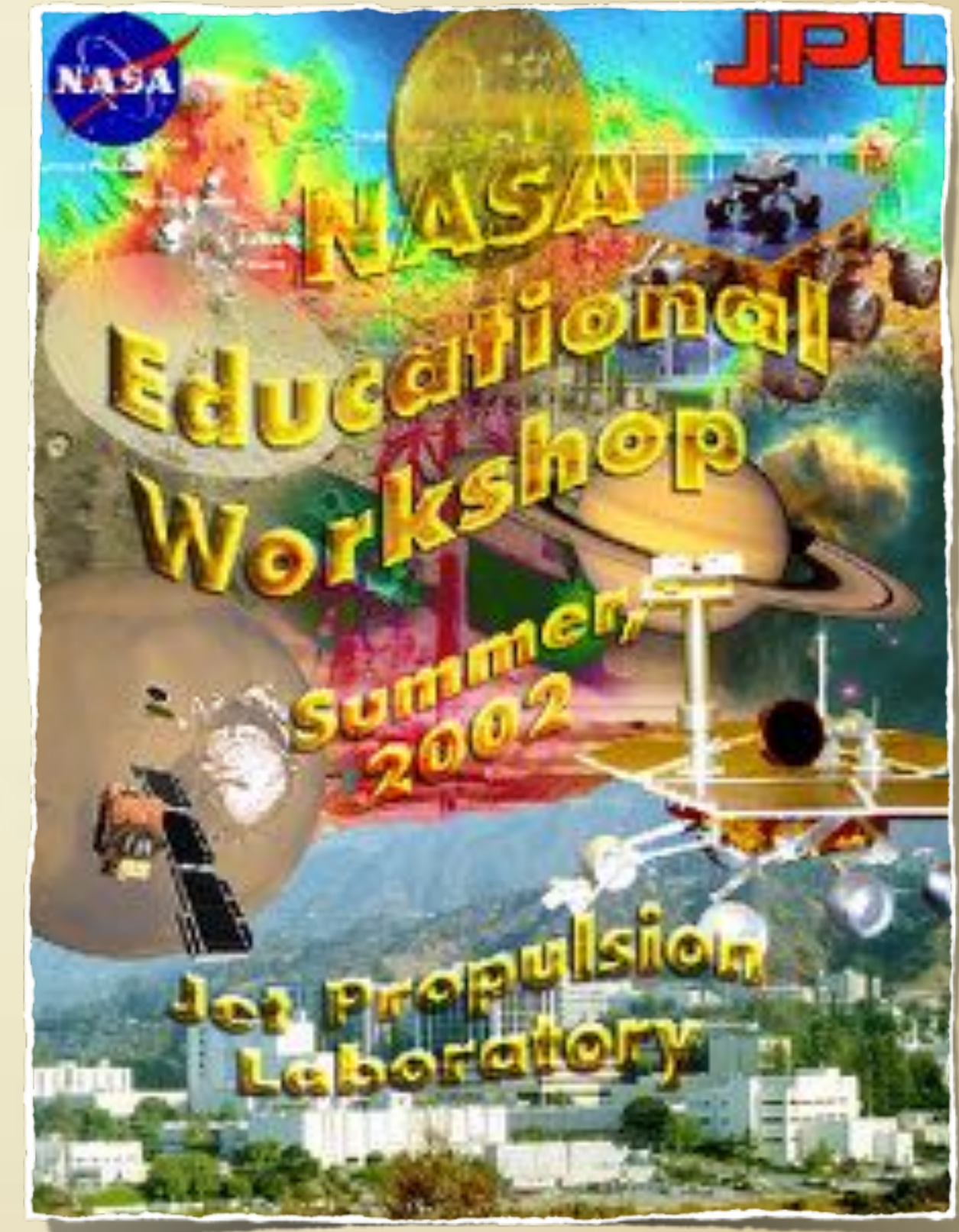


*Another example: Use Wick Editor to create an interactive informational program or game.*



# Suggested Timeline

- **Day 1:** Choose topic, software, and project type. Do background research.
- **Day 2:** Complete research and plan the project: storyboards, outlines, scripts, content lists, and other needed parts.
- **Day 3:** Create the content files: images, backgrounds, audio, film clips, etc. needed by your design.
- **Day 4:** Assemble, program, test, and revise your project. Show to teachers for approval, revise more if needed.
- **Day 5:** Submit to teachers and present project. Fill out critique Google forms for peers.



*Another possibility: Design an infographic, bulletin board, or poster on your subject in Canva or Easel.ly.*