

Solving Sticky Accessibility Problems in Virtual Lab Environments

CSUN 2023

Presenters

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Making Technology Accessible for Everyone (1 of 2)

Macmillan Learning's mission to inspire what's possible for every learner.

At Macmillan Learning we envision a world in which every learner succeeds. This vision is at the forefront of the content, tools, and services we develop.

The Macmillan Learning-TFA collaboration was established so Macmillan can benefit from the accessibility knowledge and expertise that TFA offers.

Macmillan and TFA share the goal of creating content and tools that meet (and hopefully exceed) the highest accessibility standards.

Making Technology Accessible for Everyone (2 of 2)

- Many of the TFA expert consultants are living with disabilities themselves. As regular users of assistive technologies, they can not only identify accessibility barriers when doing evaluations but also spot usability issues that may escape the notice of non-disabled users.

Macmillan benefits from TFA's expertise through

- insightful accessibility audits and product design guidance
- coding support and customized training
- content remediation and developing accessibility strategies



Intro to the lab simulations product

Lab simulations products for chemistry and biology went live in January 2020. Version 2.0 went live in fall of 2022 and added microbiology labs.

Fundamental aspects of the lab simulations

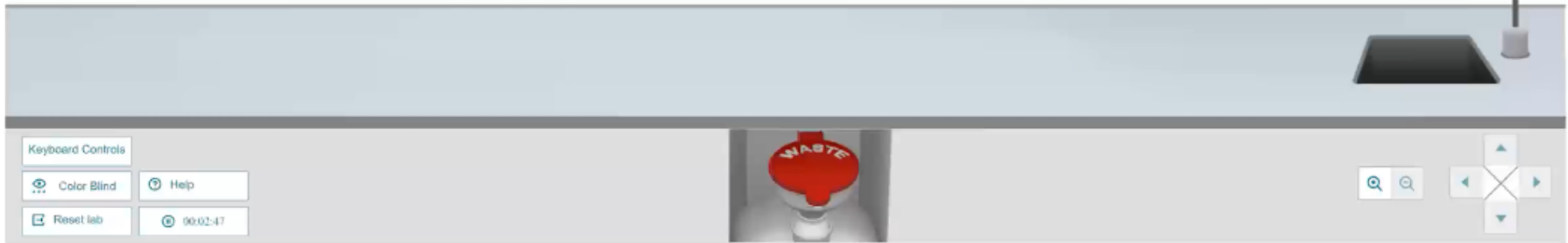
- Simulate experiments that are commonly incorporated in lab courses
- Realistic appearance and results
- Dynamic “sandbox” style experience



Lab intro demo

You are currently viewing your course as a student.

Accessibility Review: Lab8Experiment1



Procedure

Table 8.1

Drag and drop

- Drag and drop activities seem difficult to make accessible until we start to think of drag and drop as simply moving an object from one place to another
- General keyboard techniques for drag and drop are well established
- Feedback that is both visual and compatible with screen-reading technology is required
- A drag and drop web interface needs to establish keystrokes that do not conflict and are easy to convey, execute, and remember
- Leverage conventions as much as possible: e.g., Spacebar, Tab, Enter



Drag and drop demo

You are currently viewing your course as a student.

Accessibility Review: Lab8Experiment1



Procedure

Table 8.1

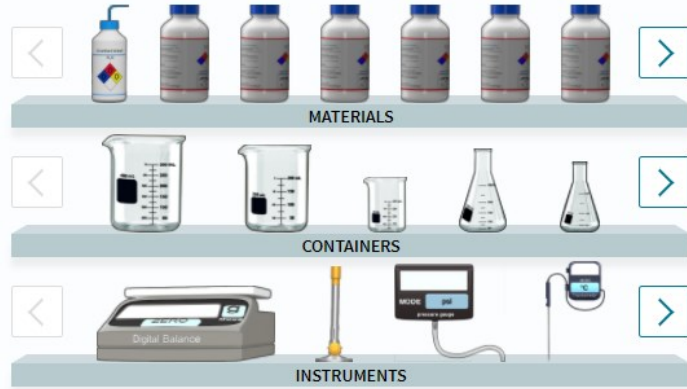
Making colors more accessible: color contrast and beyond

The simulations present a realistic lab environment with reactions and results that are based on real results and data.

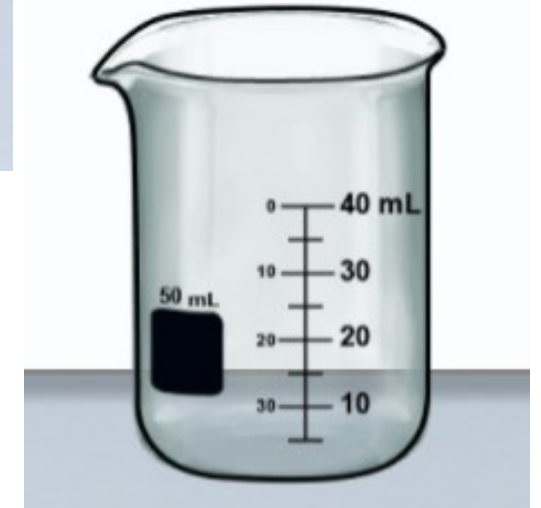
Primary features

- Use of high-contrast colors where possible
- Black outlines around objects to improve contrast against background
- Clean fonts and zoom feature
- Visual information available to screen readers
- Addition of tooltips that provide additional information about the color and state of materials

Color contrast and readability examples



Lab balance showing font size and color used for controls and display



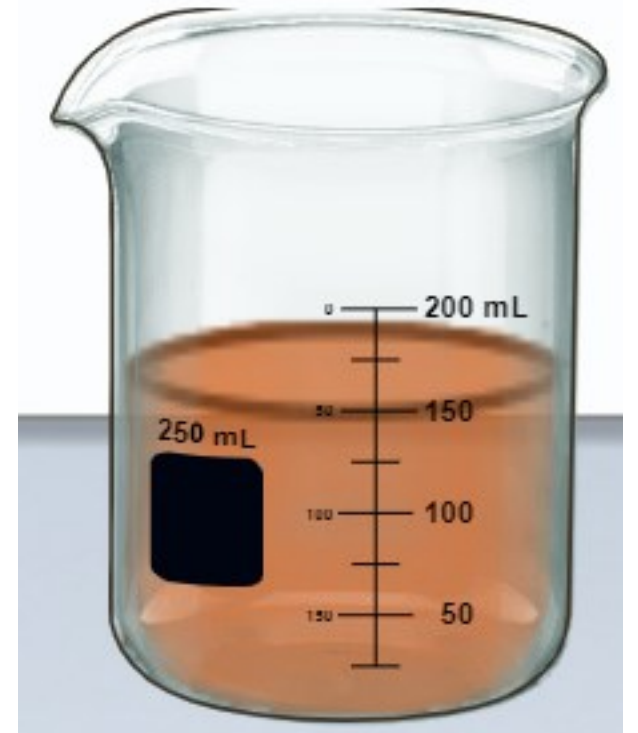
Beaker showing black outline to improve contrast



Lab environment showing color scheme and contrast levels

Color information with a screen reader

- Alt-text descriptions provide information for color and transparency
 - ARIA alerts for dynamic color changes
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- 250 mL beaker containing 149 mL of 0.5M potassium chromate and methyl yellow and audio of screen reader description

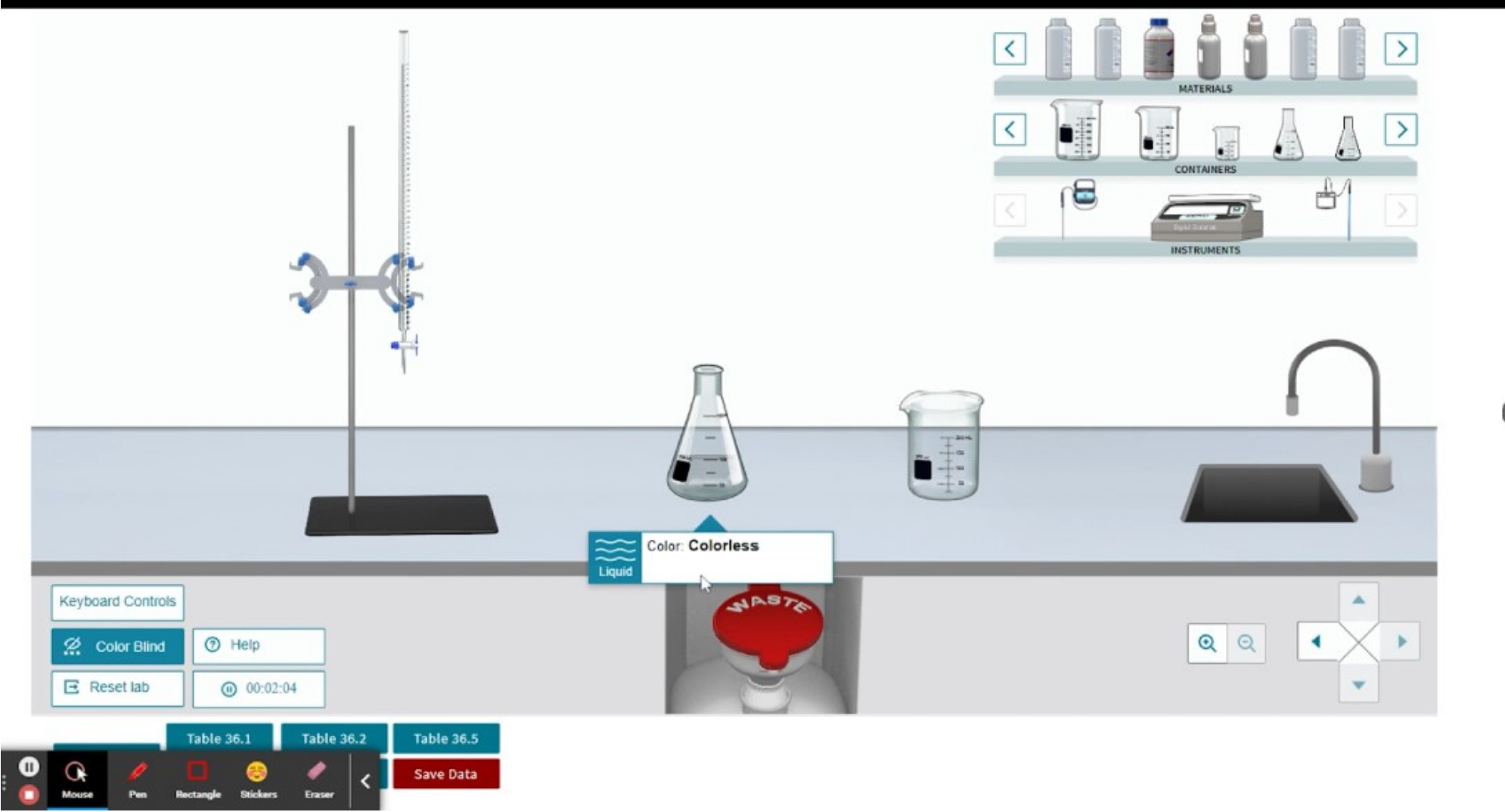


Colorblind tool

New tool added to in version 2.0

- Challenge – Use of colors based on real materials and reactions prevents use of accessible color palettes in many cases
- How the tool works:
 - Tool can be toggled on/off
 - Tool provides color information in text format
 - Gives state (solid/liquid)
 - Addresses multiple materials in one container
 - Provides location context

Colorblind tool demo



Communication

- Users may assume the activity is not accessible, so be clear in communicating its accessibility
- Language used needs to be inclusive of access type -- "drag and drop" implies mouse action
- Keyboard and screen reader users may have never had access to an activity of this type, and will need microinstructions at every step
- Keyboard instructions need to be located and labeled in a way that makes them easily found and understood
- Keep in mind that some users will not read the instructions, and so any help they get will be the microinstructions

Acknowledgements

Macmillan Learning

- Rachel Comerford
- Kim Graff
- Jen Edwards
- Heather Southerland
- Alkis Vlasis
- Cassandra Korsvik

Tech for All

- Elaine Ober
- Andre Lukatsky

Intive

- Leandro Mastakis
- Luciano Distefano
- Juan Pablo Cotini
- Juan Livingston
- Gaspar Arimany
- Juan Cruz Matar
- Andrea Orbegozo