

Gamification of Pre-Laboratory Exercises

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Improving Engagement & Effectiveness in Pre-Lab Resources

There are major concerns that in our current approach to pre-laboratory exercises do not actively engage students in what they need to know before entering the laboratory.

Pre-lab resources are common across the UK and can take a variety of forms but one of the most common is the pre-lab quiz, designed to test students basic knowledge of the activity they are about to undertake. These have shown some effectiveness in preparing students but might not necessarily go far enough

Experiment	Max Score	Average Score	Average Time
1	5	4.74	1 min
2	11	10.87	1 min
3	4	3.82	2 min
4	5	4.75	*7 hr 54 min
5	4	3.65	1 min
6	3	2.07	*19 hr 6 min

Over the course of a term Natural Science students completed six chemistry experiments – prior to attending the laboratory they had to undertake a quiz. The results above show that on average they were completing these quizzes in approximately 1-2 minutes.

Are students really engaging in this time?

Can we test everything with a quiz?

Is it possible to make the experience better?

Leicester Digital Innovation Partnership

This work is being undertaken as part of the Leicester Digital Innovation Partnership launched by the Leicester Learning Institute.

Having a student as part of this team has been invaluable as it pinpoints the difficulties that students face when coming into the laboratory

First day of labs... I've heard about these and I'm nervous. I hope I don't cause an accident or anything - I'm sure I'll be fine but who knows what might happen.

I'm sure I'm ready.

I've got my bag and its got my labcoat, safety specs and lab notebook and pen in. I think (I hope!) that's everything I need to bring...

[List of lab entry requirements](#)



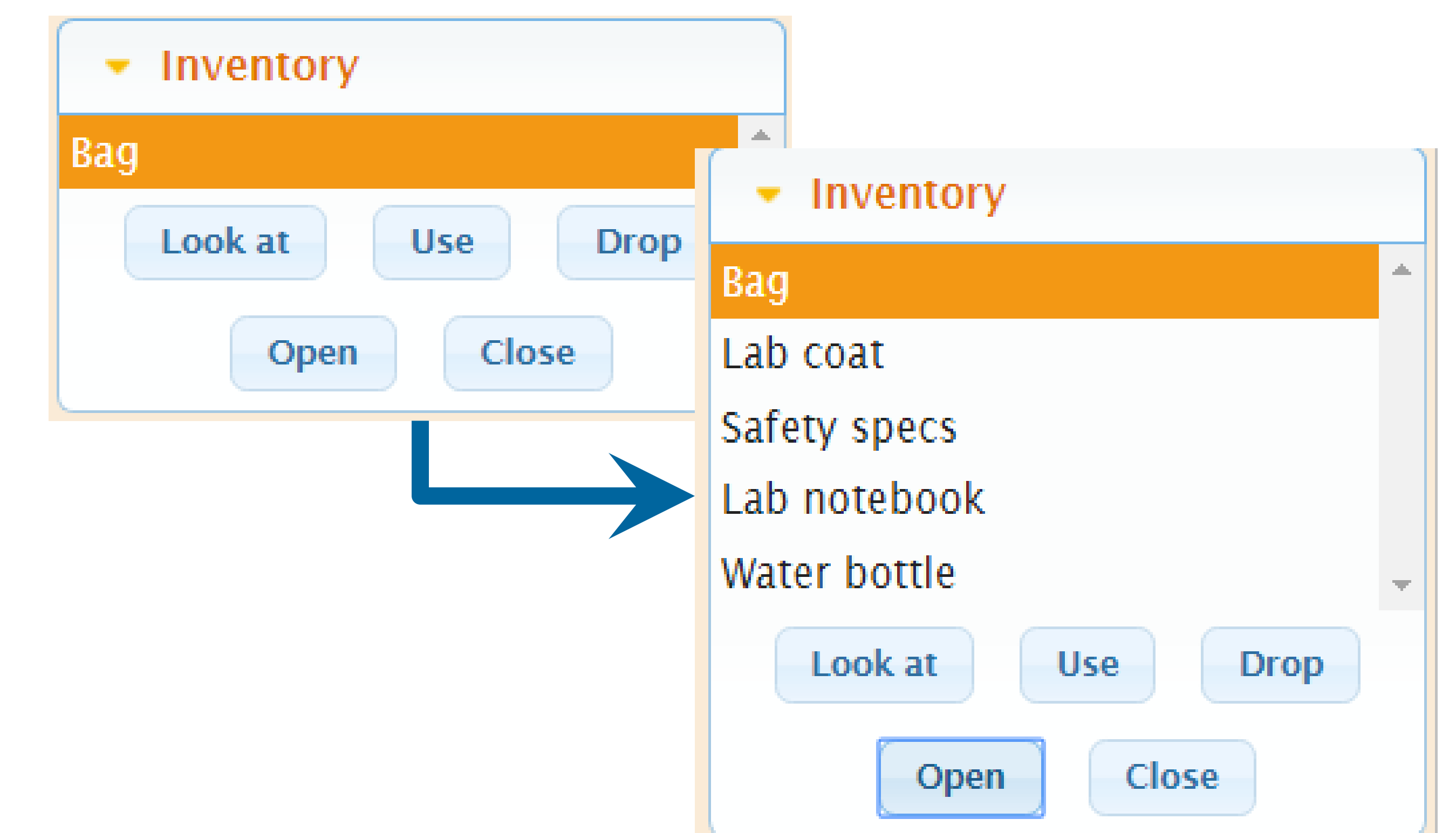
You are in a Foyer.
You can go [up](#) to the lab entrance or [down](#) to the locker corridor.

Supplement Existing Materials & Build Exciting Resources

As can be seen above it is possible to link to further resources (in this case it would be the lab handbook) including text material, videos or audio. This means that pre-lab exercises can now be more than a one way assessment of knowledge but an interactive learning experience between staff and students.

Active Decision Making

In designing the game it was important to include real-life decisions. Therefore it is impossible to enter the lab without the appropriate protective equipment.



By enabling the learner to act out these scenarios in a safe environment it is hoped that they will be more confident in their skills and in the activity that they will undertake.

The game allows the learner to interact with items and their environment. For example the figure above shows what happens when they choose to interact with their bag – in this case they can take out all of the items, “wear” their lab coat and “drink” from their water bottle.

Next Steps

It is possible to design in an array of different activities, rewards and consequences. In so doing we are creating a new and active way of engaging our students in their pre-laboratory preparation