Britannica Lesson Plan: WWI Medicine Drop

Subject: **D&T** (History, Science)

Date:

Length of Session: 4 days at 30-45 minutes each

Prior Learning: Students should have an understanding of the ways that the Royal Flying Corps and the Royal Naval Air Service (photographic reconnaissance, strafing, bombing) supported Allied efforts during World War I. Students may also be informed about the creation of the Royal Air Force.

Learning Objective: Students will research gravity and ways they can reduce the effects of gravity on a falling object. Students will plan and design a container to drop an egg from a height to simulate the RAF medicine drop. Students will analyse their results and feedback on design improvements.

Success Criteria: While keeping the egg from cracking will be an integral part of the success criteria, a well-designed and clear blueprint, plus appropriate comments after the testing should be emphasised in the success criteria for this lesson.

Appropriate for KS3 and KS4 students as part of a broader study of WWI across the curriculum.

Resources: Students will need PCs with Internet connections as well as drawing tools for their blueprints. Graph paper and pencils, rulers, compasses, etc. may all be necessary.

If you would prefer to provide all of the resources for the students, some ideas might include: lolly stick, foam, bubble wrap, string, rubber bands, paper, muslin, bin liners, tape, glue, cardboard, packing peanuts, etc.

Vocabulary:
Gravity/gravitation
Acceleration
Force
Velocity
Air bag
Parachute

Organisation: This project will work equally well as an individual or group project.

Support Staff Activities:
Support staff will be critical during student led activities and one-on-one support would be appropriate.

Britannica School resources/links:

Gravity/gravitation: http://school.eb.co.uk/levels/intermediate/article/274634
Acceleration: http://school.eb.co.uk/levels/intermediate/article/571088
Acceleration diagram: http://school.eb.co.uk/levels/intermediate/article/571088/media?assemblyId=159312
Force: http://school.eb.co.uk/levels/intermediate/article/323538
Velocity: http://school.eb.co.uk/levels/intermediate/article/339408
Air bag: http://school.eb.co.uk/levels/intermediate/article/309730
Air bag image: http://quest.eb.com/images/139_1923500
Parachute image: http://school.eb.co.uk/levels/intermediate/article/276277/media

Time:	Teacher's Activity:	Students' Activities:
Day 1		
5-10 minutes	Set the scene for students that they are in charge of a special (fictional) unit of the newly created RAF that will be dropping medical supplies to soldiers in the field. These supplies will include glass vials and they will need to consider this in their planning. Their commander would like a prototype that can then be tested.	Students might want to take notes on the situation, or a worksheet could be handed out (or PowerPoint slide created, such as the attached example).
20-30 minutes	Teacher (and support staff) can move through the room to assist students with their research, especially by using prompt questions such as "Why do we need to know about gravity?" "What do we need to consider when thinking about the package?"	Students should spend this time researching the topics around falling objects (such as gravity, velocity) as well as more information about the methods they might try (parachutes, airbags). Students can use Britannica School and other online resources. Building materials should also be made available for students as they begin to consider their design (if these are provided).
5-10 minutes	Lead a wrap up activity, such as the creation of a word bank or sticky notes with "One Thing I Learned". It is important here to check understanding of the activity as students will begin designing their containers.	Students should participate in the wrap up activity or in small groups discuss the important things to consider. This would also be a great time for them to see available materials!
Day 2		
5-10 minutes	Explain to students that today they will begin designing their containers using the provided tools. As they will be testing with just an egg, instead of a crate of supplies, remind students that they will need to create a scale. If no building materials have been provided, it might be useful to create a list with the class with what they can use from home.	Students may want to have another look at the materials that are available for building, or ask any remaining questions they have about the activity.
25-35 minutes	Both the teacher and support staff should spend this time moving around the room and helping students as they consider their design.	Depending on the level of students and amount of building material, it might be appropriate to have students work in groups for their designing. At this stage, students should create their blueprint and include information to justify their choices (perhaps using the attached brief). The blueprint and explanation can be completed for homework depending on the amount of time in class.

Time:	Teacher's Activity:	Students' Activities:
Day 3		
10-15 minutes	Observe student interactions and designs.	Have students form pairs and explain their design to each other. The listening students should ask questions such as "Have you thought of…?" or "Why did you choose…?" to ensure that each student has thoroughly considered their design.
20-35 minutes	Hand out eggs and help students as necessary.	Build! Remind students that they should build according to their specifications and if they need to make any design modifications, they should note this down in their blueprint and on their briefs (or in their notebooks). Students will need enough time to tidy away their projects.
Day 4		
5-10 minutes	Again, help students as necessary as they finish up their building.	Students should make any adjustments they might need to their design.
5-10 minutes	Depending on the space, you may want to be in charge of the dropping of the eggs, but if at all possible, let students do this themselves. Help to organise this part of the lesson.	Students will need to drop their eggs from a height. This could be from a ladder in a field outside the school, or from a window if the class is high enough off the ground.
10 minutes or homework	Answer any questions students may have.	Students should evaluate their design: not only the success of the drop, but what they feel might have helped/hindered that success and also what improvements might be made. Students should also reflect on the ease of scaling up their container to be appropriate for the RAF to drop and if the materials used would be easy for the military to obtain.

Plenary: A class discussion, reflecting on why it would have been difficult for the RAF to be involved in getting medical equipment to the front line, would be a great way to wrap up the lesson. This conversation could include not only factors about designing a drop vessel, but also accuracy, safety and coordination.

Differentiation: If you are supplying all available materials, then asking students to work in mixed groups is a great way to ensure that students can get additional support when necessary. Allowing students to research other designs for the same project might also be helpful for students who need additional support. To challenge students, restrict the types of materials they have available or raise the height of the drop (if possible).

Assessment Opportunities: While the success or failure of the actual drop should be a part of any assessment criteria, a clear and justified blueprint, as well as effective analysis after the test, is more important to the project.

WWI Medicine Drop Lesson, Appendix I (template)

When creating a project, you may be asked to explain why you have made certain decisions. For the design of the medicine delivery system, please answer the following questions.

1. What materials have I decided to use in the creation of my medicine delivery system? Why have I chosen these materials over others?

2. How large will my delivery system be? How might this affect the medicine inside?

3. How do I plan to ensure that my delivery system stays intact before the fall?

4. Is the design of my delivery system easy to replicate on a large scale?

5. What will the resource costs of my design entail?