Create a lesson for the year above

Primary: (ages 7 – 11)	Mathematics

Students create an arithmetic challenge for the year above, according to a provided lesson structure. These arithmetic challenges/lessons are then completed by the year above to see how well they work. This challenges students to explore arithmetic knowledge, play with unusual ideas, work together to design a lesson, and finally look at the result critically. The ultimate goal is not the creation of the lesson for the year above per se. Instead this creative process is a means to enable students to think about what makes a sum easy or difficult. This is particularly useful at the end of the year to focus on transition to the year above.

Time allocation	3 lesson periods
Subject content	Arithmetic - Can be focused on area of maths as appropriate to teaching context (e.g. multiplication, division, big or negative numbers; percentages; decimals etc.)
Creativity and critical thinking	This unit has a **creativity** and **critical thinking** focus: - Explore and generate ideas for a maths lesson - Play with unusual ideas and make connections between different levels of maths - Find alternative perspectives and challenge assumptions about easiness/difficulty of maths
Other skills	Collaboration
Key words	arithmetic; big numbers; percentages; decimals; multiplication; division; fractions

Products and processes to assess

Students work collaboratively to produce an inventive lesson plan. More importantly, though, their work process shows the confidence to explore and challenge their current knowledge and imagine what might come next. They are able to come up with ideas for how mathematics might become more difficult, make connections to the mathematics they have already studied, and articulate why they have made their final choices for the lesson plan.

Teaching and Learning plan

This plan suggests potential steps for implementing the activity. Teachers can introduce as many modifications as they see fit to adapt the activity to their teaching context.

Step	Duration	Teacher and student roles	Subject content	Creativity and critical thinking
1	Lesson 1 (15-30 mins)	The lesson starts with a short introduction: *Next year you will be in a new school year, which will be really exciting and different. Maths will also be different. Who has any ideas about the sorts of things you will learn in maths next year?* Students brainstorm briefly about what will change. Teacher leads a discussion. *What did you do this year? How will maths get harder next year? What sort of sums do you think you will have to do next year?* Alternatively, the teacher can use one or a set of specific maths exercises that students have already seen in the current year (e.g. in a previous exam), and use them as a basis for the discussion: *e.g. how can we make this exercise more difficult/complex? How could we extend it?* Teacher explains that students will now work in pairs to create some lessons/sums/challenges for the year above. These exercises will be given to the year above to see if they can do them.	Teachers can choose to focus this discussion on a particular topic in mathematics. Using mathematical language and concepts to describe a problem	Generating appropriate and interesting ideas, and reviewing alternative perspectives
2	Lesson 1 and 2	Before students start work, criteria are discussed. The lesson they invent needs to: • Relate to one of the themes from the lesson book/curriculum or from a provided list of examples (for example 'multiplication', 'division', 'fractures', 'decimals', 'percentages', 'big numbers' or 'negative numbers'). • It is useful if the teacher gives the students a structure for their lesson. (E.g. The lesson must consist of three parts: an arithmetic exercise; a part where something new is introduced or something is explained; and a third exercise that uses what has been introduced/explained.) • The exercises must be difficult enough for the year above but not so difficult that they don't understand! Students then start working together in pairs (formed according to level). They decide on a theme, discuss, and develop their ideas on a blank page in their books. They can illustrate the exercise with drawings if relevant and the final version is copied onto a sheet to be given to the year above. Teacher circulates, making suggestions, challenging students to make the exercises more difficult or easy and giving feedback	Demonstrating ability to work well with partner Discussing what they know already and reflecting on what they might do next year (e.g. maybe next year,	Making connections between different levels of knowledge, playing with ideas about difficulty, imagining alternative perspectives, envisioning and producing a meaningful lesson/challenge

		Students present the exercises they have developed to the class and teacher leads a discussion about which ones students think are most suitable/hardest/easiest etc. and why. The exercises are then given to the year above to complete before the next lesson	we'll learn to divide by 100. Or do sums with negative numbers.)	Challenging assumptions about what students in year above can do
3	Lesson 3	The year above should now have completed the exercises. Students receive the results and check the answers provided by the year above. The teacher explains how to check the exercises or gives an answer key. The class has a discussion about the answers. This gives feedback to pupils: Were the exercises you invented understood? Were they not too easy or too difficult? It might be that an exercise was not completed by a student from the year above. The class can then discuss this: Why did you think they could do it? Apparently something you understand/create yourself might not be clear for someone else. It is exactly for this reason that it's good to get others to look at your work and give feedback on it. To conclude, students fill in the reflection and feedback form (see Appendix 1).	Teachers can choose to focus this discussion on a particular topic in mathematics and use this to remind students about what has been covered recently/this year.	Identifying strengths and weaknesses, reflecting on chosen maths approach relative to possible alternatives

Resources and examples for inspriation

Web and print

- ➢ Form on which the lesson gets filled in (e.g. in the format of *World in Numbers*)
- ➢ Evaluation form

Other

- ➢ Pen and pencil.

Opportunities to adapt, extend, and enrich

- ➢ Students could be asked to create lessons for the year below or an exchange can be set up whereby students in different years exchange lessons/challenges for each other
- ➢ Teachers could ask students to focus on a particular area of mathematics and use preliminary class discussions/presentation to review relevant subject content

|	**Creativity and critical thinking rubric for maths**	• Mapping of the different steps of the lesson plan against the OECD rubric to identify the creative and/or critical thinking skills the different parts of the lesson aim to develop

|	**CREATIVITY** **Coming up with new ideas and solutions**	**Steps**	**CRITICAL THINKING** **Questioning and evaluating ideas and solutions**	**Steps**
INQUIRING	Make connections to other maths concepts or to ideas from other disciplines	2	Identify and question assumptions and generally accepted ways to pose or solve a maths problem	3,1
IMAGINING	Generate and play with several approaches to pose or solve a maths problem	2	Consider several perspectives on approaching a maths problem	2-3
DOING	Pose and envision how to solve meaningfully a maths problem in a personally novel way	2	Explain both strengths and limitations of a different ways of posing or solving a maths problem based on logical and possibly other criteria	2
REFLECTING	Reflect on steps taken to pose and solve a maths problem		Reflect on the chosen way maths approach and solution relative to possible alternatives	3

Feedback form

Name………………………………………………

How did you like this lesson?
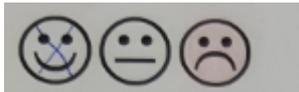
How did 'working together' go?
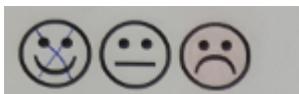
What did you learn from this lesson?

How did you use creative thinking in this lesson?

What did you like the least about this lesson?

What made this lesson interesting for you?