

The Pie of Life

Primary: (ages 7 – 11)

Mathematics

In this exercise, students are required to create pie charts depicting how they spend their time. Firstly, working individually children estimate how much time they spend each week on different activities such as eating, sleeping, seeing and playing with friends, watching TV, playing on computers, working at school, playing sports, etc. Secondly, working in groups they share their pie charts with others commenting and suggesting changes. Finally, in a group they have to discuss and create a pie chart which outlines the ideal time allocation.

Time allocation 2 lesson periods

Subject content Developing essential numeracy skills: calculating simple percentages
Understanding the application of mathematics
Interpret numerical information and create charts

Creative and critical thinking This unit has a **creativity** and **critical thinking** focus:

- Generate ideas for how to divide time and approach problem
- Appraise and justify personal position with sound logic
- Consider multiple perspectives and reflect on chosen solution relative to alternatives

Other skills Communication, Collaboration

Key words time; percentage; pie chart; angles; pastimes; hobbies; division; categories; debate

Products and processes to assess

Students produce individual and collaborative pie charts and take part in brainstorming and discussion sessions concerning their ideal division of time. At the highest levels of achievement, they produce accurate and detailed pie charts, consider several ways of approaching the problem, generate many new ideas, are able to justify them effectively with no/few errors in their workings. Their work process demonstrates that they are open to the input and feedback of others. They are willing to challenge ideas to their limits before making final choices, and can convincingly explain why final choices have been made.

Authors: Paul Collard/CCE and Paul Gorman/Hidden Giants (United Kingdom). This work was developed for the OECD for the CERI project *Fostering and assessing creativity and critical thinking skills*. It is available under the [Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO](https://creativecommons.org/licenses/by-nc-sa/3.0/) licence (CC BY-NC-SA 3.0 IGO). © OECD

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 period 1	On a piece of paper and working individually, each student works out how much time each week they spend undertaking a range of activities such as sleeping, eating, working at school, playing with friends, seeing family, playing sports, going shopping, etc. They need to decide which units of time would be most useful for coming up with their estimation of the time spent on each. They should think carefully about what categories of activity they should measure.	Units of time Using categories Calculating time spent on different categories	Generating ideas for categories, pastimes, and units of time
2		Having calculated the time spent on each activity, students need to work out the percentage of their week spent on each. They then draw a circle on an A4 sheet of paper and divide the circle into segments, each segment accurately representing the percentage of time spent each week on each activity. To do this they will have to calculate the angle of each segment at the centre of the circle. Then working in small groups, they share their charts, commenting and suggesting changes. Following this, they rework their pie charts.	Simple percentages Pie charts Technical skill in producing pie chart	Considering several perspectives and reviewing own work Reflecting on chosen maths approach relative to possible alternatives
3	Lesson period 2	Working in groups, students start with an A3 sheet on which has been drawn a large circle. They have to look at the pie charts they have produced and consider what the ideal allocation of time would be. They should be specifically asked to consider questions such as, how much time should students spend daydreaming? How much time playing with their friends? How much time with their families? How much time should they spend at school? Should the pattern of time allocation change, for instance having a sleep immediately after coming home from school, but staying up late, or going home at lunchtime every day, but coming to school all day Saturday instead? In each case they have to explain why it is important and what the benefits are. They should also consider other things they could do which they are not currently doing but that would be enjoyable or beneficial. This might include being creative or engaging in interesting and unusual pastimes or activities.	Reviewing and expanding categories Becoming aware of personal contribution to the group discussion	Appraising and justifying their personal position logically and reasonably Generating unusual ideas for pastimes and categories Identifying and questioning assumptions and generally accepted ways of dividing time
4		Once they have come up with a new list, and allocated amounts of time against them, they have to create a new pie chart. This pie chart should be a collaborative effort, each contributing to the calculations, and helping to draw. The group should discuss how the chart can be most impactful, perhaps colouring in different segments or placing small drawings in them. Once the groups have finished, each group should present their final pie chart to the whole class, justifying the conclusions they have reached. There should be a general class discussion about which allocation of time is best and why. Finally, each child should write a commitment to themselves about one thing about their use of time they will change. They read these out as appropriate.	Calculating ideal times and drawing a collaborative pie chart Making a commitment to improvement in one area of the way they spend time	Making connections between their own ideas and those of others Reviewing the opinion of others and finding and/or comparing their own perspectives Explaining strengths and limitations of different ways of dividing time

Resources and examples for inspiration

Web and print

- N/A

Other

- A 4 and A3 sheets of paper. A3 sheet have large circles drawn on them. Pencils. Compasses or other instruments for drawing circles. Rulers. Protractors or similar.

Opportunities to adapt, extend, and enrich

- Further links could be made to health and well-being. Students, for example, could be asked to do independent research on the negative and positive impacts of different activities on health and well-being.

Creativity and critical thinking rubric for mathematics

• 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	4	Identify and question assumptions and generally accepted ways to pose or solve a maths problem	3
IMAGINING	Generate and play with several approaches to pose or solve a maths problem	1,3	Consider several perspectives on approaching a maths problem	2,4
DOING	Pose and envision how to solve meaningfully a maths problem in a personally novel way	2,4	Explain both strengths and limitations of different ways of posing or solving a math problem based on logical and possibly other criteria	3,4
REFLECTING	Reflect on steps taken to pose and solve a maths problem	2	Reflect on the chosen maths approach and solution relative to possible alternatives	2,4

Appendix

Example:

