

Maynooth University Computational Thinking Transition Year Module

Lesson: Decomposition

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Topic:	Decomposition
Subject area:	Computational thinking
Class:	Transition year
Duration needed:	40 – 60 min
Prior knowledge of students:	None

Activity objective(s):	<p>Students will:</p> <ul style="list-style-type: none"> - understand what decomposition means in computer science - know different aspects of decomposition - be able to solve a problem by breaking it into parts - practice problem solving in a small group or in pairs - practice explaining how they come up with their answer
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Materials for the lesson

Student class materials:	<p>Lesson slides for students: Decomposition_lesson.pdf</p> <p>Decomposition introduction video (10 - 15 mins introduction to topic with one sample task): Decomposition.mp4. Watching the video can be given as homework prior to the lesson.</p> <p>Example task Decomposition-Gossiping.pdf</p>
Materials for student activities:	<p>Three tasks for the student activity:</p> <ul style="list-style-type: none"> - Decomposition-Beaver_the_alchemist.pdf - Decomposition-Jigsaw_puzzle.pdf - Decomposition-Footprints.pdf
Teacher resources:	<p>PowerPoint presentation with introduction and student activity slides: Decomposition.pptx</p> <p>Example task with solution: 2013-SI-01-Gossiping-MU-TY-eng.pdf</p> <p>Three tasks for the student activity with solutions:</p> <ul style="list-style-type: none"> - 2015-RU-07-Beaver_the_alchemist-MU-TY-eng.pdf - 2020-CN-04-Jigsaw_puzzle-MU-TY-eng.pdf - 2014-DE-02-Footprints-MU-TY-eng.pdf

Timing for 40 min lesson (– 60 min lesson)

10 min (– 15 min)	<p>Lesson presentation. Either present the PowerPoint presentation to the class, play the video to the class*, or ask the students to individually view the video. Includes introduction to decomposition, aspects of decomposition**, and example of solving one Bebras computational thinking task using decomposition.</p> <p>[Up to and including “Aspects of decomposition”, Slides 1-15 in the presentation]</p> <p>* If you choose to show the video during the lesson you may go over time [total video length 15:22]. Watching the video can be given as homework prior to the lesson.</p> <p>** Optional, subject to available time and student ability</p>
20 min (– 25 min)	<p>Solving three Bebras tasks: Beaver the alchemist, Jigsaw puzzle, and Footprints.</p> <p>Teacher will display the three tasks in the PowerPoint presentation (starting from slide with title “Tasks for today”), hand out printed tasks to the class, or students can access the electronic PDF versions themselves.</p> <p>Students work in pairs or groups of three, discussing approaches for solving the task and agreeing on a solution.</p>
10 min (– 20 min)	<p>As a class, go through solutions to the three computational thinking tasks. [In PowerPoint presentation, and also in teacher PDF version of task.]</p> <p>Encourage students to explain their solutions and the approaches they considered.</p>

Differentiation

Developing	Two of the three tasks for the student activity
Intermediate	All three tasks for the student activity
Advanced	All three tasks plus “Aspects of decomposition” slide
Extension activity:	Get students to draw a 5-tree and a 6-tree with following the rules in the <i>Footprints</i> task.

