
## Teaching notes

## How to use this resource

This resource, *Parallelendicular*, is designed to support student use of laptops in both online and offline classroom environments.

The mix of online and offline resources and tasks in this resource is intended to promote student understanding and capability in investigating the properties of straight lines. Students work mathematically and build their capacity to use a variety of information and communications technologies.

### Explore

The [Math Warehouse page](http://www.mathwarehouse.com/algebra/linear_equation/real-world-application.php) on real-world applications of linear equations provides useful background to explore the various ways to graph linear equations. Parallel linear equations do not have a simultaneous solution.

### Your tasks

1. Students should click on either the icons or the hyperlinked text to view each particular task in a pop-up window. Links have been provided if additional resources are required to complete the task.
2. Brief student instructions for using particular software programs are provided with each task. Other tutorials offering additional assistance are also available online.

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| **Task 1:** **Investigation** GeoGebra, Word | Students investigate the parameters of straight lines by creating two GeoGebra files. They use them to answer a series of questions before saving, printing or emailing their files. They create a dynamic worksheet that is suitable to be completed in pairs.1. It is wise to complete the tasks prior to the lesson to be clear on the instructions and aware of the range of responses that may occur.2. The instructions have been written for GeoGebra Classic, which can be downloaded or used online [here](https://www.geogebra.org/classic). |
| **Task 2:** **Investigation**GeoGebra, Word, presentation software | Students investigate the features of parallel and perpendicular lines by creating a GeoGebra file. They use Captivate to record a demonstration of their construction and how they used it to make their responses before sharing it as a .pdf file.See the additional instructions from Task 1. |
| **Task 3:** **Investigation**Geogebra, note-taking software  | Students consolidate their understanding from the previous tasks, and make a summary in OneNote. They publish their notes as a .pdf file.Consider asking students to make a short presentation of their summaries. |

### Quality teaching framework

This resource has been developed to support pedagogy and improve student outcomes based around the NSW Quality Teaching framework, with particular focus on the following elements:

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| ***Intellectual quality*** | ***Quality Learning Environment*** | ***Significance*** |
| 1.1 | Deep knowledge | **[ ]**  | 2.1 | Explicit quality criteria | **[ ]**  | 3.1 | Background knowledge | **[ ]**  |
| 1.2 | Deep understanding | **[ ]**  | 2.2 | Engagement | **[x]**  | 3.2 | Cultural knowledge | **[ ]**  |
| 1.3 | Problematic knowledge | **[ ]**  | 2.3 | High expectations | **[x]**  | 3.3 | Knowledge integration | **[ ]**  |
| 1.4 | Higher-order thinking | **[x]**  | 2.4 | Social support | **[ ]**  | 3.4 | Inclusivity | **[ ]**  |
| 1.5 | Metalanguage | **[x]**  | 2.5 | Students’ self-regulation | **[x]**  | 3.5 | Connectedness | **[ ]**  |
| 1.6 | Substantive communication | **[x]**  | 2.6 | Student direction | **[ ]**  | 3.6 | Narrative | **[ ]**  |

**GeoGebra File SAMPLES**

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| **TASK A:** | **TASK B:** | **TASK C:** |