# LESSON PLAN

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## Lesson Plan

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| **Lesson Title: Combining Like Terms** | **Date: March 10, 2024** |
| **Grade Level: 8** | **Subject/Strand: Mathematics/Algebra** |
| **Topic: Algebraic expressions** | **Length of Period: 1 period/50 minutes** |

**Lesson Plan Description** -- What do I want the learners to know and/or be able to do? What are the big ideas/enduring understandings for the lesson/unit? Indicate using 1-2 sentences.

Learners should be able to combine like terms and simplify algebraic equations in order to solve them.

### *STEP 1: CURRICULUM CONNECTIONS*

| **Ontario Curriculum Overall Expectations** (numbers from documents and details) | **Ontario Curriculum Specific Expectations** Numbers from documents and details -- a realistic number of expectations (1 or 2), connect to assessment. |
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| **C2.** Equations and Inequalities demonstrate an understanding of variables, expressions, equations, and inequalities, and apply this understanding in various contexts | **C2.1** add and subtract monomials with a degree of 1, and add binomials with a degree of 1 that involve integers, using tools |
| **Learning Goals** **Discuss with learners: *What will I be learning today?*** Clearly identify what learners are expected to know and be able to do. | **Success Criteria** **Discuss with learners: *How will I demonstrate what I have learned?*** Teacher/learner identify 'look fors' in language that learners can readily understand. |
| We are learning to…<br>● Combine like terms<br>● Identify monomial/binomial expressions | I can …<br>● Explain/show our work to demonstrate understanding of the concepts<br>● Create monomial and binomial expressions |

### *STEP 2: ASSESSMENT*

**Indicate purpose of the assessment :** **[×] *FOR*** **[ ] *AS*** **[ ] *OF***

**Indicate Achievement Chart categories being assessed**
**[×] *Knowledge and Understanding*** **[ ] *Thinking*** **[ ] *Application*** **[ ] *Communication***

**Indicate Learning Skills/Work Habits:**
[ ] responsibility, [ ] organization, [×] independent work, [ ] collaboration, [ ] initiative, [ ] self-regulation

| **Indicate Assessment Mode:** | **Indicate Assessment Strategy:** | **Indicate Assessment Tool:** |
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| Written - worksheet requires answer & work | Independent work | Taking the (front) sheet up together as a class |

### *STEP 3: CONSIDERATIONS FOR PLANNING*

**Prior Learning: What prior experiences, knowledge and skills do the learners bring with them to this learning experience?**
Multiply and divide fractions, BEDMAS, concepts of algebraic equations and fact families, pre-algebra flowchart

**IEP program implications: Accommodations, Modifications** -- To be completed for Placements 2, 3 and 4

**Differentiation** -- How will I differentiate the instruction to ensure the inclusion of all learners? (Choose 1 or 2 areas in Year 1)

**Process:** This worksheet should be review - will be modeled for students who need more help, then small group or independent work w/ help/conferencing
For **Michael**: in the lesson, integration into using computers and Lego for more tactile learning, and small-group work in this scenario may help him (no need for handwriting, as they work as a group, they can share a sheet or have it typed out – the sheet will be made available on Google Classroom)
For **Sandra**: the game and Legos are more visual and require less words overall. Using the Legos, we can also do a physical representation that (1) can be understood with symbols and not words and (2) the worksheet can be translated; groupwork should keep her confident and comfortable asking questions about concepts that aren't clear
For **Anish**: the lesson is designed around visual aids – while the demonstration of learning may be written, this can be offset by group work (group members can complete the sheet) and Anish can contribute towards the answers and discussion either verbally or showing the learning using the provided Legos).

**Resources and Materials & Technology Integration** -- List ALL items necessary for the delivery of the lesson. Include any attachments of learner worksheets used and teacher support material that will support communication of instruction.

2-step algebraic expressions worksheet
Legos
Collecting like terms worksheet
- https://www.splashlearn.com/math-vocabulary/algebra/term

Computers & projector

## Three Part Lesson

**Indicate Instructional Strategy** – teacher-led instruction, pairs/small groups, independent

**Minds on: Motivational Hook/engagement /Introduction** (approximately 10-20%) 5 minutes
How will I engage the learners (motivational strategy, hook, activation of learners prior knowledge, activities, procedures, compelling problem)?

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| https://html5.gamedistribution.com/2dee9d404697435aa76111eb4015e1d5/ | **Prompting Questions and Possible Learner Responses:**<br>Play this game, get as high of a score as you can in 5 minutes! **Then, students explain how to play the game.**<br>• Ideally, students will discuss combining the same fruit, to make different (larger) fruits. You can only combine the same fruit with itself<br>• The metaphor is that the *fruit* is a *variable.* We can only combine two fruits of the same type. Once the fruit *changes,* it becomes a "different" variable (even if it's still a fruit) and we cannot add it to any other variable type<br>  ○ note that it doesn't count as "kiwi is $x$ , and then passionfruit is $x^2$ because we added 2 kiwis together." In this case, merging is *multiplication* and the *ability to merge* is adding.<br>  ○ Maybe just focus on the fact that we can only combine same fruits, and terms mean that the variable needs to |

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| | look the EXACT SAME<br>• We can only combine terms that have the SAME VARIABLE – that is, we start with **expanding** every term, and add variables that are the same – we will note that terms with exponents are actually multiplied, and cannot ADD them because it is not the same. |

**Action: During /Working on it** (approximately 60%) 30-40 minutes
How will I provide practice of new concepts, and have them demonstrate new learning?

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| 1. Take up questions from homework (10 minutes)<br>2. Discuss "simplifying" and "collecting like terms" (20 minutes)<br>a. Explain what a term is, and why we can't "combine" them → ___nomial<br>b. Practice identifying terms<br>c. Practice collecting like terms<br>3. Apply learning to two-step equations (10 minutes)<br>a. As a class<br>b. Independently or small-group for (home)work | **Prompting Questions and Possible Responses:**<br>How was the game similar to collecting like terms? Each fruit represents a variable at different stages of "exponents" - we can "merge" lemons together (x and x) but once we do that ($x^2$) we can no longer merge the lemon (x) with the kiwi ($x^2$) so they are different TERMS even though they're all "fruit" (variables)<br><br>Bring Legos – each brick is a base variable. Once we have exponents, we will put two bricks together. That brick combination is now ONE brick (can't be separated).<br>• We can ONLY combine bricks of the same size.<br><br>**Term**: A number, variable, or some combination of the two combined with multiplication or division.<br>**Coefficient**: The number in front of variable(s) in a term<br>**Exponent**: The power of a variable or number. It is a part of the same term as its base. |

**Consolidation & Connection (Reflect and Connect)** (approximately 10 - 20%) 5-10 minutes
How will I bring all the important ideas from the learning experiences together for/with learners? How will I check for understanding?

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| Homework: finish combine like terms sheet, finish one-step negative variables sheet. | **Prompting Questions:** |

**Extension Activities** -- What will learners do when work is completed? What will learners do if they finish early?

There is an extra worksheet.

**Next Steps** -- Where will this lesson lead to next?

Creating one-step and two-step algebraic equations from word problems