

DMT INSTITUTE

Developing Mathematical Thinking Institute (DMTI)



Professional
Development



Curricular
Resources



Assessment

Jonathan Brendefur, PhD

Misconceptions 1

WORKSHEETS 1.1-1.3

DMTI Varied Practice Worksheets

This PowerPoint or PDF displays the worksheets that have varied situations (context, visual, equations, and other mathematical models) for children to work on. By completing these worksheets, children increase their foundational skills in the topic, which will help them with these standards and future mathematical topics.

1. If using a journal, have children present the worksheet and complete all the problems.
2. Or print the 'Varied Practice Worksheet Slides' for them to work on. Then, you can return to the PowerPoint or PDF to look at the keys to check their work.

Grade 6-8: Misconceptions 1

Materials Needed

Printed copies of the Misconception Worksheets

Instructions

Worksheet 1.1– 1.3

Students are presented with a situation that may involve a misconception made by a fictional student. Students should use words, visual models (bar model or number line) and/or equations to demonstrate what is incorrect and how to correctly solve/model the problem.

Press students to use at least one of the words from the word bank in each explanation.

Worksheet 1.1 – Misconceptions

Yvette made the following bar model for the expression $4x$. Is she correct? Why or why not? Explain your answer with words and a visual model.

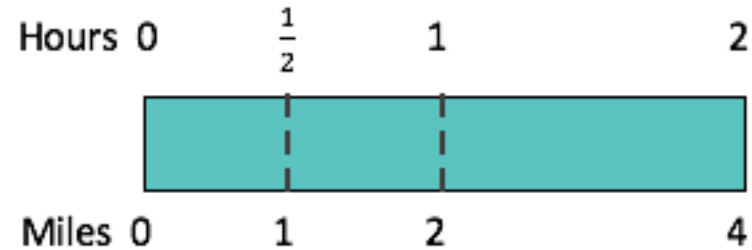


Word Bank:

Iterate	Unit
Partition	Multiplicative
Compose	Additive
Decompose	

Worksheet 1.2 – Misconceptions

Justin made the following bar model to represent the situation of hiking 4 miles in 2 hours. After looking at the model, he said he could represent the relationship between hours and miles with the equation $2M = H$. Is he correct? Use the model to justify your reasoning.



Word Bank:

Iterate	Unit
Partition	Multiplicative
Compose	Additive
Decompose	

Worksheet 1.3 – Misconceptions

Grant found two picture frames in his house. One frame holds a 3in x 5in photo and the other holds a 6in x 8in photo. Grant says since 3 inches were added to each dimension the frames hold proportionally sized pictures. Do you agree? Use a model and ratio table to explain your thinking.

Word Bank:

Iterate	Unit
Partition	Multiplicative
Compose	Additive
Decompose	



“The Developing Mathematical Thinking Institute (DMTI) is dedicated to enhancing students’ learning of mathematics by supporting educators in the implementation of research-based instructional strategies through high-quality professional development, curricular resources and assessments.”

For more information contact
Dr. Brendefur at jbrendefur@dmtinstitute.com



Yvette made the following bar model for the expression $4x$. Is she correct? Why or why not? Explain your answer with words and a visual model.



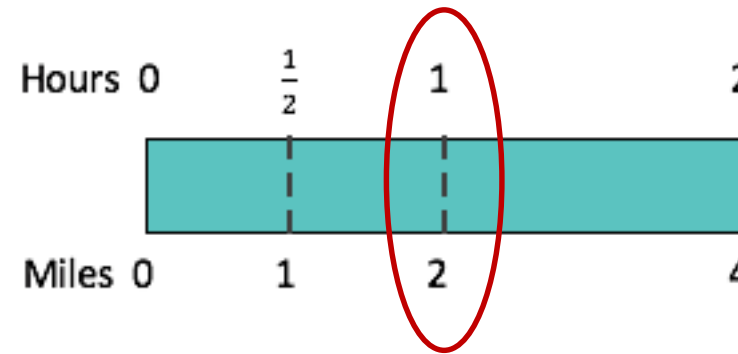
Yvette's model is incorrect. Her model shows $x+4$ because it is composing the two amounts. The expression $4x$ is telling us we have 4 iterations of the unknown unit x . The model below shows the correct bar model for $4x$.



Word Bank:

Iterate	Unit
Partition	Multiplicative
Compose	Additive
Decompose	

Justin made the following bar model to represent the situation of hiking 4 miles in 2 hours. After looking at the model, he said he could represent the relationship between hours and miles with the equation $2M = H$. Is he correct? Use the model to justify your reasoning.



Justin is correctly seeing the doubling relationship between hours and miles, but has written the equation incorrectly. Since the number of miles is always twice the number of hours we need to multiply unit of hours by 2 or 2 iterations of hours is equal to the miles, so the equation would be $M = 2H$.

We can check this by putting in numbers from the model. By using the circled location in the model we know that hours=1, so if $M=2(1)$ our miles should be 2 which is what is shown in the model.

Word Bank:

Iterate	Unit
Partition	Multiplicative
Compose	Additive
Decompose	

Grant found two picture frames in his house. One frame holds a 3in x 5in photo and the other holds a 6in x 8in photo. Grant says since 3 inches were added to each dimension the frames hold proportionally sized pictures. Do you agree? Use a model and ratio table to explain your thinking.

Grant is incorrect because the frames need to have a multiplicative relationship to be similar and he used an incorrect additive strategy. If we put the dimensions of the 3x5 photo in a ratio table we can see that if the length is doubled from 3 to 6 then the width needs to be doubled from 5 to 10 (see below). If only 3 was added to the width the picture would not look the same – it would look squished or stretched in places – because it was not doubled in size like the other dimension.

	$\times 2$		
Length (in)	3		6
Width (in)	5		10
	$\times 2$		

Word Bank:

Iterate	Unit
Partition	Multiplicative
Compose	Additive
Decompose	