

Functioning Together

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Summary	Students work together to develop multiple representations of a function. The students split up into groups of three with each student having a separate responsibility. When all the input values have been used up, the students are asked to, together, make up a story that describes their function.
Goals	<ol style="list-style-type: none">1. Get students to work together, to pay attention to what the others are doing and saying.2. Promote cross-representational thinking (input list, table, parallel number lines, and story)
Materials	The three different handouts to be given to each triplet of students.
Keywords	Hands-On Activity Linear Functions Mapping Number Lines Production of Stories Production of Tables Small Group Work

Activity Plan:

1. Assigning Roles and Working Together

Explain that there are three distinct yet complementary roles for students on this task: Manager, Table Maker, and Arrow Maker.

The Manager (Student A) holds the list of inputs and keeps track of the progress of the other two students' work (page 1). When the Table Maker and the Arrow Maker think their work is done, the Manager helps all three decide if it was done correctly. Only when the Table Maker and Arrow Maker's work are complete should the manager fill in the bottom of her worksheet (regarding the story).

The Table Maker (Student B) gets an input from student A and fills in one row in her table (page 2), representing the "uncomputed" value in the middle column and the computed value in the right column.

The Arrow Maker (Student C) takes the input and output and represents the ordered pair as an arrow from one number line to another. The input value of r must be located on the lower number line. The output value of t is located on the upper number line. She draws an arrow from the lower to the upper number line, connecting the input and output values (page 3).

Take some care in assigning students their roles. Use your own discretion in composing groups and assigning roles.

At each table, clarify:

Who will be the Manager?

Who will be the Table Maker?

Who will be the Arrow Maker?

Walk through the first example with the students.

2. Discuss Work of Groups

Have Students in each group explain their work for a few rows.

3. Homework (Page 4)

Explain the homework. It is very similar to the class work, but each student will compute the values (part of the role of the Table Maker) and will take the role of Arrow Maker.

Handout: Manager's Worksheet

(Page 1)

Name: _____ Date: _____

Partners' Name: _____

Give each input (r) to the Table Maker.

When the Table Maker and the Arrow Maker have done their work for each of the inputs, as a team create a story to represent the function.

Value of r	Table Maker's work	Arrow Maker's work
3		
1		
4		
7		
5		
6		
0		
2		
8		
r		

Handout: Table Maker's Worksheet

(Page 2)

Name: _____ Date: _____

Partners' Name: _____

Use the input value (r) given to you by the Manager to complete each row.

When you're done give the ordered pair (r, t) to the Arrow Maker.

Input	Uncomputed output	Output
r	$1 + r \times 4$	$t = 1 + r \times 4$
3	$1 + 3 \times 4$	13
r		

Handout: Arrow Maker's Worksheet

(Page 3)

Name: _____ Date: _____

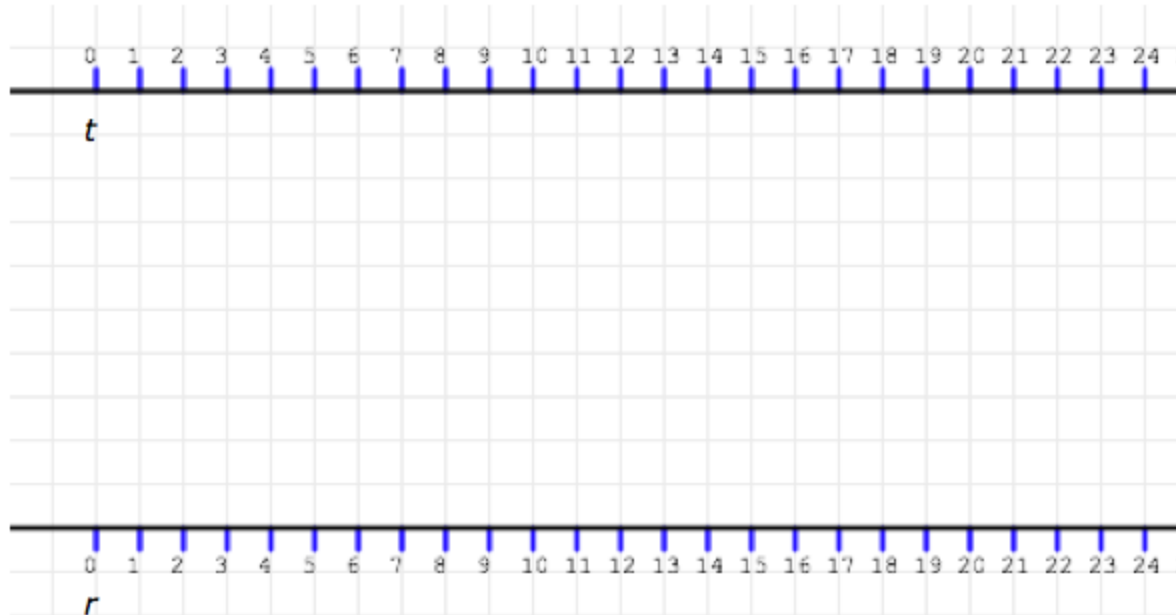
Partners' Name: _____

Put a dot on the bottom number line (r -line) to represent the first input given by the Manager.

Put a dot on the top line (t -line) to represent the output computed by the Table Maker.

Then draw an arrow from the input to the output on the number lines.

Repeat for each ordered pair.



Handout: Homework

Name: _____ Date: _____

Partners' Name: _____

Use the input value (*r*) in the first column to complete each row.

Input	Uncomputed output	Output
<i>p</i>	$p \times 4 - 1$	$t = p \times 4 - 1$
3	$3 \times 4 - 1$	11
1		
4		
7		
5		
6		
0		
2		
8		
<i>p</i>		

Handout: Homework

(Page 2)

Name: _____ Date: _____

Partners' Name: _____

Put a dot on the bottom number line (p -line) to represent the first input in the table (page 1).

Put a dot on the top line (t -line) to represent the first output in the table.

Then draw an arrow from the input to the output on the number lines.

Repeat for each ordered pair.

