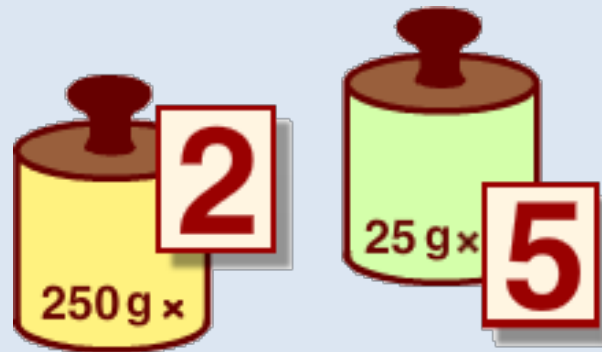
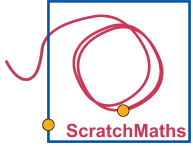


# BUILDING WITH NUMBERS

## MODULE 4: INVESTIGATION 4

### Exploring Conversions





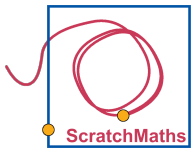
## MODULE 4: INVESTIGATION 4

### Activity 4.4.1 – Converting Length



#### ACTIVITY 4.4.1

# Converting Length



## MODULE 4: INVESTIGATION 4

### Activity 4.4.1 – Converting Length

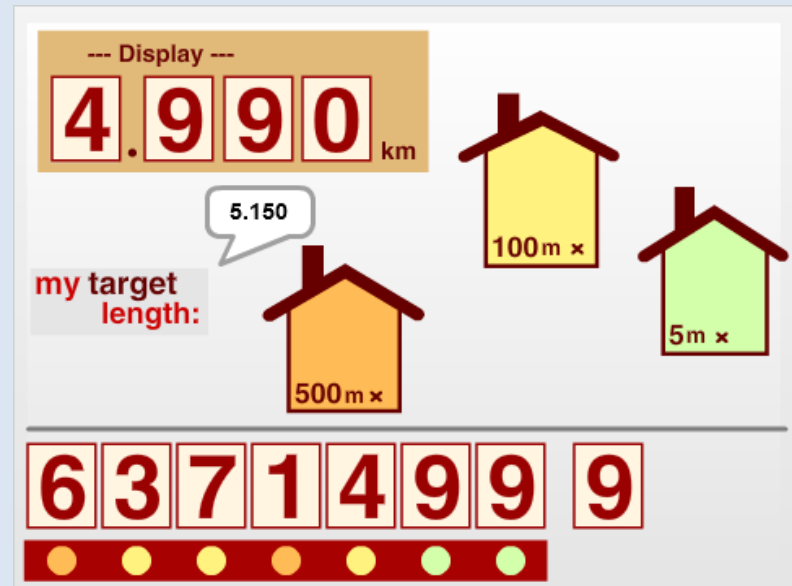


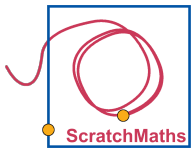
#### Open project **4-Converting Length**

- if online Save as a copy and add your name
- if offline Save as and add your name

- ☐ Explore the project, run its green flag and explore how each house contributes to the Display.

Explore the **input's** scripts to understand what happens with the input value when dragged over the **500 m ×** house, **100 m ×** house or **5 m ×** house.





## MODULE 4: INVESTIGATION 4

### Activity 4.4.1 – Converting Length



- ◆ How many metres in 1km? How many 500m in 1km? How many 5m in 1km?
- ◆ Which record of 7 input digits would produce the smallest possible length? What is the biggest length that can be build in 7 steps?
- ◆ How could you build the 9.999km target number?
- ◆ What length would be displayed based on the input values below?

?

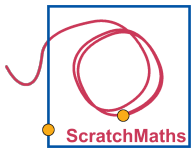
1	1	1	1	1	1	1	
●	●	●	●	●	●	●	

7	7	7	7	7	7	7	
●	●	●	●	●	●	●	

5	5	5	5	4	4	2	
●	●	●	●	●	●	●	



## MODULE 4: INVESTIGATION 4

### Activity 4.4.1 – Converting Length



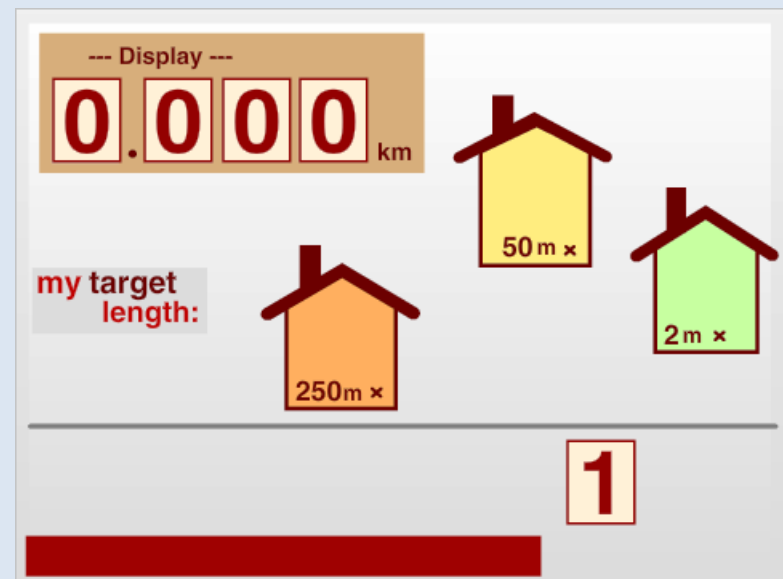
☐ [Extension] Switch the backdrop to *converting length 2*.

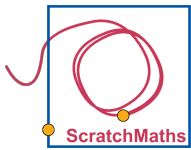
- ◆ What is different?
- ◆ Will the game work correctly now? If not, explain why?



☐ [Extension] Which scripts need to change?

Start fixing the **input** value when over the **2 m ×** green house. Test with different **input** values.



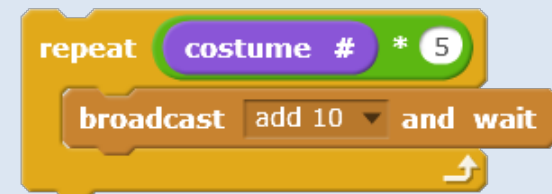
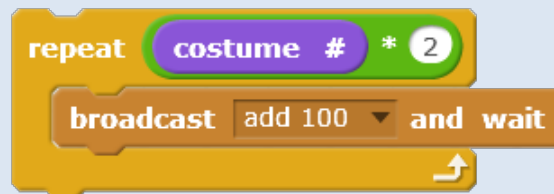


## MODULE 4: INVESTIGATION 4

### Activity 4.4.1 – Converting Length

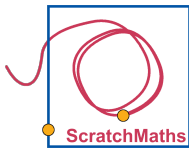


- ☐ [Extension] Fix the **input** value behaviour when atop the **50 m ×** yellow house. Test with different **input** values.
- ☐ [Extension] The most complex is the **250 m ×** orange house as it should contribute to **hundreds** and to **tens**:



- ◆ Can we simply snap these two repeat structures together to become a new definition of the **in orange** block?
- ◆ In which order? Does it matter?





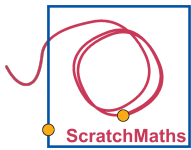
## MODULE 4: INVESTIGATION 4

### Ext. Activity 4.4.2 – Converting Mass



#### EXTENSION ACTIVITY 4.4.2

# Converting Mass



## MODULE 4: INVESTIGATION 4

### Ext. Activity 4.4.2 – Converting Mass

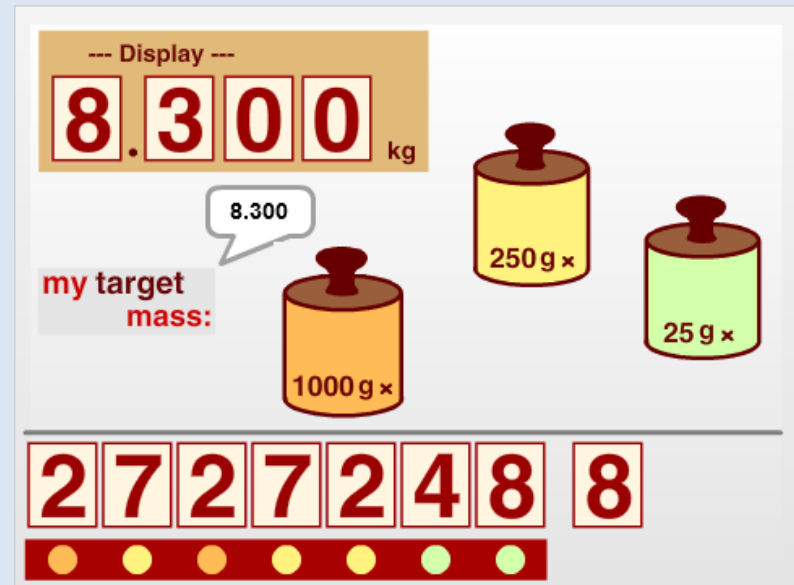


#### Open project **4-Converting Mass**

- if online Save as a copy and add your name
- if offline Save as and add your name

- ☐ Explore the project, run its green flag and explore how each house contributes to the Display.

Explore the **input's** scripts to understand what happens with the input value when dragged over **1000 g x** mass, **250 g x** mass or **25 g x** mass.





## MODULE 4: INVESTIGATION 4

### Ext. Activity 4.4.2 – Converting Mass



- ◆ How many grams in 1 kg? How many 250 g in 1 kg? And in 2 kg? ?  
How many 25 g in 1 kg? What fraction of 1 kg is 250 g?
- ◆ Which record of 7 input digits would produce the smallest possible mass? What is the biggest mass that can be built in 7 steps?
- ◆ How could you build the 9.995 kg outcome?
- ◆ What masses would be displayed based on the input records below?

4	4	4	4	2	2	2	<input type="text"/>
●	●	●	●	●	●	●	

2	5	2	5	2	5	5	<input type="text"/>
●	●	●	●	●	●	●	

2	2	2	2	2	2	2	<input type="text"/>
●	●	●	●	●	●	●	

## MODULE 4: INVESTIGATION 4

### Ext. Activity 4.4.2 – Converting Mass



☐ Switch the backdrop to *converting mass 2*.

◆ What is different?

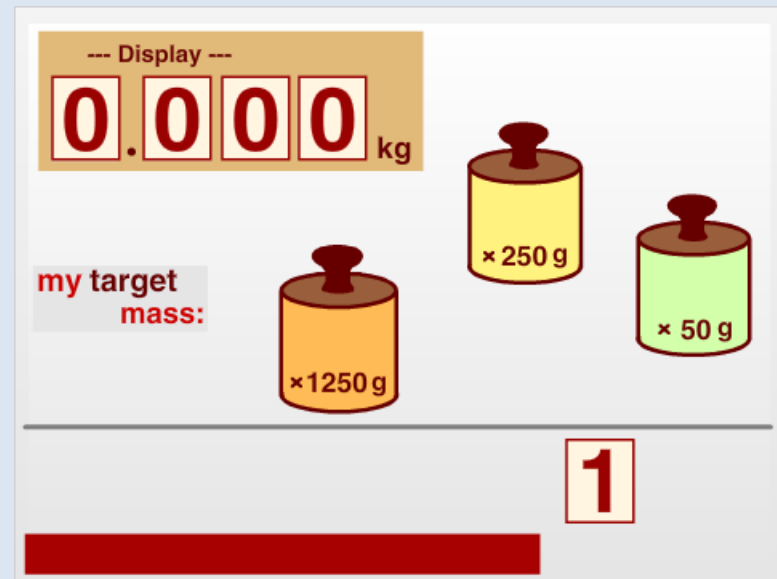
◆ Will the game work correctly now? If not, explain why?



☐ Which scripts need change?  
Start fixing the **input** value when over the **50 g x** green house. Test with different **input** values.

--- Display ---  
**0.800** kg

**1825** **5**



## MODULE 4: INVESTIGATION 4

### Ext. Activity 4.4.2 – Converting Mass

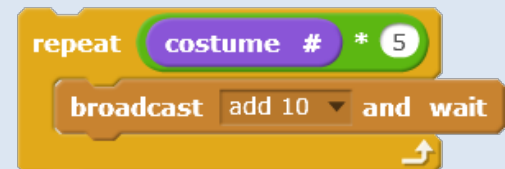
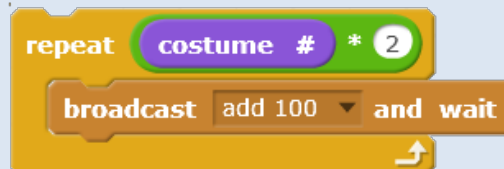


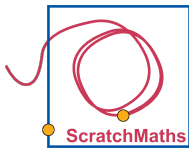
- ☐ Fix the **input** value behaviour when over the **200 g ×** yellow house. Test with different **input** values.
- ☐ The most complex is the **1250 g ×** orange house as it should contribute to **thousands, hundreds** and **tens**:



- ◆ Do you see how these scripts could generate the number 1250?
- ◆ Can we snap these three scripts into one? In which order? Does it matter?

?





## MODULE 4: INVESTIGATION 4

### Ext. Activity 4.4.3 – Converting Time



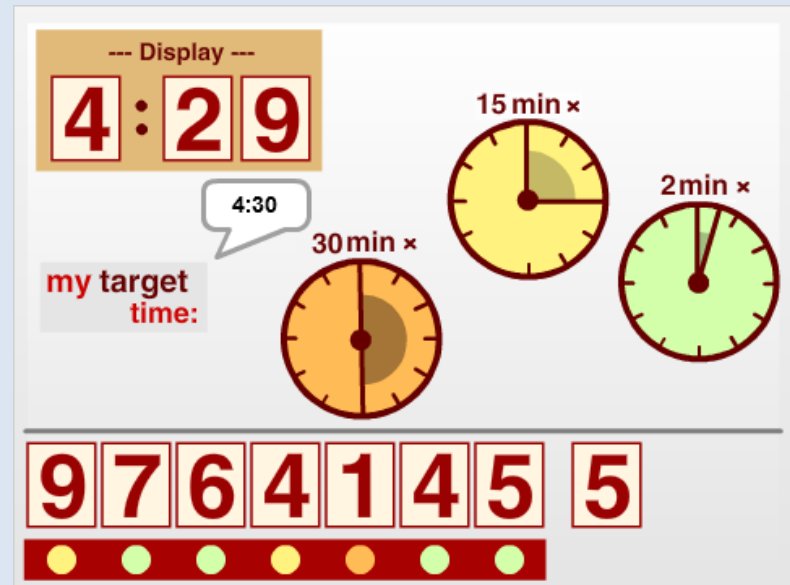
### EXTENSION ACTIVITY 4.4.3

# Converting Time

### Open project **4-Converting Time**

- if online Save as a copy and add your name
- if offline Save as and add your name

- ☐ Explore the project, run its green flag and explore how each house contributes to the Display.
- ☐ Explore in particular the **input's** scripts to understand what happens with the input value when dragged atop **30 min ×** dial, **15 min ×** dial or **2 min ×** dial.



## MODULE 4: INVESTIGATION 4

### Ext. Activity 4.4.3 – Converting Time



- ◆ How many minutes in 1 hour? How many 2 mins in 1 hour? And in half an hour? How many 15 mins in 1 hour? And 30 mins in 1 hour?
- ◆ Which record of 7 input digits would produce the smallest possible time? Is it possible to build 3:33 in 7 steps? Is it possible to build 1:00 in 7 steps? Is there more than one solution?
- ◆ What time would be displayed based on these input records?

4	4	4	4	4	4	4	<input type="text"/>
●	●	●	●	●	●	●	

5	1	5	1	5	1	5	<input type="text"/>
●	●	●	●	●	●	●	

3	3	3	3	3	3	3	<input type="text"/>
●	●	●	●	●	●	●	

## MODULE 4: INVESTIGATION 4

### Ext. Activity 4.4.3 – Converting Time



☐ Switch the backdrop to *converting time 2*.

- ◆ What is different?
- ◆ Will the game work correctly now? If not, explain why?

☐ Which scripts need change?  
Fix the **input** value over each dial. Test with different **input** values.

--- Display ---  
**2:00**

**222** **2**

● ● ●

--- Display ---

**2:00**

10 min ×

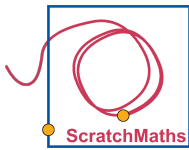
45 min ×

5 min ×

my target time:

**222** **2**

● ● ●



# MODULE 4: INVESTIGATION 4



## My **Investigation 4** check list:

- ☐ I reached the target length, mass and/or time in 7 steps or less.
- ☐ I envisaged the increase in the kilometre display when adding different amounts of metres before trying in Scratch.
- ☐ **[Extension]** I envisaged the increase in the kilogram display when adding different amounts of grams.
- ☐ **[Extension]** I envisaged the increase in the hours display when adding different numbers of minutes.
- ☐ **[Extension]** I adapted the conversion game by changing the background and updating the scripts to be able to play with different amounts of metres, grams and/or minutes.