**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per.\_\_\_\_\_\_\_ Score:\_\_\_\_\_**

**U8 CW #2** *Representations of a Function*

Functions can also be described by non-numeric relations. A **mapping** is a representation of a function that helps to better understand non-numeric relations. Study each relation and its mapping below. Then decide if the relation represents a function. Explain your answer.

|  |  |  |
| --- | --- | --- |
| 1. **Input:** circumference of finger   **Output:** ring size  *Ring Size*  *Circumference*  14.1mm  14.9 mm  15.7 mm  16.5 mm  3  4  5  6  Function? Explain. | 1. **Input:** state a person lives in   **Output:** the team they root for in college football  *Team*  *State*  Utah  Nevada  Arizona  Cougars  Utes  Sun Devils  Function? Explain. | |
| 1. Write the ordered pairs (circumference, ring size) that correspond to problem #1. | 1. Write the ordered pairs (state a person lives in, team they root for) that correspond to problem #2. | |
| 1. **Input:** city student lives in   **Output:** high school they go to  *School*  *City*  Salt Lake City  Provo  Kamas  East HS  Skyline HS  West HS  Timpview HS  Provo HS  South Summit HS  Function? Explain. | | 1. **Input:** Age   **Output:** Level of Baseball Team  *Baseball Level*  *Age*  5  6  7  8  9  10  Provo  Kamas  Tee Ball  Minor League  Junior League  Function? Explain. |

There are many ways to represent a relation or function.

In the following problems, you will be given one representation of a relation and asked to create additional representations. Then, you will be asked to determine whether the relation represents a function or not.

1. **Story:** A candle is 27 centimeters high and burns 3 centimeters per hour. An equation that models this relation is where *c* is the height of the candle in centimeters and *h* is the number of hours the candle has been burning.
   1. Express this relation as a table, mapping, graph, and set of ordered pairs.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Candle by mart - A lit candle**Table**   |  |  | | --- | --- | | Time (hours)  *h* | Height (cm)  *c* | |  |  | |  |  | |  |  | |  |  | |  |  | | **Mapping**   |  |  | | --- | --- | | *Hours* | *Height* | |  | | |
| **Graph** | **Set of Ordered Pairs** |

* 1. Is the height of the candle a function of the amount of time it has been burning? Explain.

|  |  |
| --- | --- |
| *x* | *y*  -1  0  1  2  0  1  -1  2  -2  3  -3 |
|  | |

1. **Mapping:**
2. Express this relation as a table, graph, and set of ordered pairs.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table**   |  |  | | --- | --- | | *x* | *y* | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | **Graph** | **Set of Ordered Pairs** |

1. Is this relation a function? Explain.

**Directions:** Determine if each relation or situation defines a function. Justify your answer.

It may help to make an additional representation of the relation (especially if the problem is a context).

|  |  |
| --- | --- |
| 1. {(30, 2), (45, 3), (32, 1.5), (30, 4), (41, 3.4)} |  |
|  |  |
| |  |  | | --- | --- | | *Letter Grade* | *Percentage* | | A  B  D  95%  88%  87%  66% | | | 1. Is letter grade a function of percentage scored on a test? |
| |  |  | | --- | --- | | *Time of Day* | *Temperature* | | 8:00 AM  12:00 PM  2:00 PM  4:00 PM  7:00PM  65  70  75  80 | | | 1. Is time of day a function of the temperature? |
| |  |  | | --- | --- | | **Length of Radius**  **(cm)** | **Length of Diameter**  **(cm)** | | 0.5 | 1 | | 1 | 2 | | 1.5 | 3 | | 2 | 4 | | 1. **Input:** name of city in the U.S.   **Output:** state city is in  *Hint:* There are 16 states in the United States that have a city called Independence. |