Name: _____

Date: _____

ACTIVITY 2

Designing and Implementing a Custom Class

You have likely created a class from a given description or specification several times. This is an important skill, but equally important is the ability to determine essential information to include when creating a class. What is "essential" can vary based on perspective, or can be determined by a question that is being asked or a problem that is attempted to be solved. This activity will give you an opportunity to practice making this type of determination. Consider the following selection.

Name	Type	Calories	Protein	Fat	Sodium	Fiber	Carbohydrates	Sugar	Potassium	Vitamins	Shelf	Weight	Cups	Rating
100% Bran	C	70	4	1	130	10	5	6	280	25	3	1	0.33	68.402973
100% Natural Bran	C	120	3	5	15	2	8	8	135	0	3	1	1	33.983679
All-Bran	C	70	4	1	260	9	7	5	320	25	3	1	0.33	59.425505
All-Bran with Extra Fiber	C	50	4	0	140	14	8	0	330	25	3	1	0.5	93.704912
Almond Delight	C	110	2	2	200	1	14	8	-1	25	3	1	0.75	34.384843
Apple Cinnamon Cheerios	C	110	2	2	180	1.5	10.5	10	70	25	1	1	0.75	29.509541
Apple Jacks	C	110	2	0	125	1	11	14	30	25	2	1	1	33.174094
Basic 4	C	130	3	2	210	2	18	8	100	25	3	1.33	0.75	37.038562
Bran Chex	C	90	2	1	200	4	15	6	125	25	1	1	0.67	49.120253
Bran Flakes	C	90	3	0	210	5	13	5	190	25	3	1	0.67	53.313813
Cap'n'Crunch	C	120	1	2	220	0	12	12	35	25	2	1	0.75	18.042851
Cheerios	C	110	6	2	290	2	17	1	105	25	1	1	1.25	50.764999
Cinnamon Toast Crunch	C	120	1	3	210	0	13	9	45	25	2	1	0.75	19.823573
Clusters	C	110	3	2	140	2	13	7	105	25	3	1	0.5	40.400208
Cocoa Puffs	C	110	1	1	180	0	12	13	55	25	2	1	1	22.736446
Corn Chex	C	110	2	0	280	0	22	3	25	25	1	1	1	41.445019
Corn Flakes	C	100	2	0	290	1	21	2	35	25	1	1	1	45.863324
Corn Pops	C	110	1	0	90	1	13	12	20	25	2	1	1	35.782791
Count Chocula	C	110	1	1	180	0	12	13	65	25	2	1	1	22.396513
Cracklin' Oat Bran	C	110	3	3	140	4	10	7	160	25	3	1	0.5	40.448772
Cream of Wheat (Quick)	H	100	3	0	80	1	21	0	-1	0	2	1	1	64.533816

https://www.kaggle.com/crawford/80-cereals/version/2#cereal.csv

1. Each row of the table represents an instance of an object. What is the best name for that object?

2. Your teacher will provide you with a question to answer related to the above table. Write the question here:

3. You will now design a class to describe that object and answer your given question. Write the class header:

4. How many instance variables will you create?

5. List the data types and names you will use for the instance variables.

6. Create a new Java file named `Cereal.java` and implement the class described above. Your class should contain all necessary instance variables, constructors, accessors methods, and a `toString` method.

Tips

Constructors are not methods and so have no return type. They are special blocks of code that for the purposes of this class should be declared public and have the same name as the class.

When assigning values to instance variables the type of variable cannot be included. If the type is included before the variable name in the constructor, this creates a local variable of the same name that is initialized and the instance variables of the object are never initialized. Once the constructor is complete the local variables no longer exist, leaving only the uninitialized instance variables.

7. Write a `main` method to test your `Cereal` class by implementing multiple instances of `Cereal` objects. This program should include lines instantiating `Cereal` objects.

Check Your Understanding

8. Given your class design, determine one additional question that you can answer without making any changes to `Cereal.java`.

9. Identify one additional question that can be answered from the given data that you are not able to answer based on your implementation of `Cereal.java`.

10. What modification could you make in order to answer this question?