**Title: Eating and Exercise**

**Introductions**

In this activity you will investigate the physical science of eating and exercising and the relationship between calories consumed with calories burned.

1. Click this link: <http://phet.colorado.edu/>

This is a screen shot of the website:



2. Click the “Play with sims” button.

3. Click “New Sims” -> Click “Eating and Exercise”->Click “Run Now!”

4. It will take time to load and then this screen appears:



Switch between this document and the sim to complete the activity.

**Exploration Phase**

1. Insert your own/realistic information (Age, Lifestyle, height, and weight)
2. Place various foods that you would typically eat in a day on the plate: breakfast, lunch, and dinner
3. Freely explore different combinations of daily exercise with a typical daily calorie intake.
4. Play the simulation and see how your typical lifestyle (calorie intake in combination with your typical daily exercise) affects your weight as time passes. (Set the time for 1 year)

*Questions*

1. How many total calories per day are eaten for this person?
2. How many total calories per day are burned through exercise?
3. Based on your responses to the previous questions, what is the expected lifestyle if this person followed this regimen everyday? Why?

**Explanation Phase**

Aim: Create a rule that describes a balanced lifestyle using a combination of diet and exercise.

Here are some concepts:

**Food dragged to the plate will add calories**

**Exercise/activity dragged to the notebook will take calories away (subtract)**

The way a person lives their days has a general impact on the Cal/day that their body requires.

Click on the “?” symbol and learn about the different lifestyle types.

Using the simulation set the person parameter settings for a 25 yr old female that is 5’3, 165lbs, and 29.4% body fat.

|  |  |
| --- | --- |
| **Lifestyle** | **Lifestyle Cal/day burned** |
| Very Sedentary |  |
| Sedentary |  |
| Moderate Activity |  |
| Very Active |  |

\*Lifestyle cal/day burned is found in orange

Now set the person parameter settings for a 25 yr old male that is 5’10, 190lbs, and 20% body fat.

|  |  |
| --- | --- |
| **Lifestyle** | **Lifestyle Cal/day burned** |
| Very Sedentary |  |
| Sedentary |  |
| Moderate Activity |  |
| Very Active |  |

\*Lifestyle cal/day burned is found in orange

Which lifestyle type requires the most calories per day for both male and female when no exercise is being performed? Why do you think this is so?

**Come up with a rule for a balanced lifestyle using a combination of diet and exercise/lifestyle.**

**Application Phase:**

Set the person parameters to any realistic setting of your choosing for a female:

Lifestyle:

Height:

Weight:

\*The % body fat will adjust automatically for you.

\*Set the time to show 1yr.

Use the simulation to complete the chart below.

|  |  |  |
| --- | --- | --- |
| **Cal. Intake/ day** | **Cal. burned/ day** | **Gain/Loss/Maintain** |
| 1500 |   |  |
|  | 350 |  |
|  |  | Maintain |

\*Remember that 3500 calories = 1.0lb of fat

\*Click on the more tabs to see more options of food and exercise activity

Set the person parameters to any realistic setting of your choosing for a male:

Lifestyle:

Height:

Weight:

\*The % body fat will adjust automatically for you.

\*Set the time to show 1yr.

Use the simulation to complete the chart below.

|  |  |  |
| --- | --- | --- |
| **Cal. Intake/ day** | **Cal. burned/ day** | **Gain/Loss/Maintain** |
| 1900 |  |  |
|  |  | Maintain |
|  | 500 |  |

\*Remember that 3500 calories = 1.0lb of fat

\*Click on the more tabs to see more options of food and exercise activity

**Conclusion: Compare the data and explain how it supports your rule.**