

FOOD AND THE BODY: **FOOD AND THE BRAIN**



SUMMARY

This lesson teaches how food impacts brain health and how supporting gut health is necessary to maintain good mental health and promote a healthy brain. We will discuss foods that support brain health and foods that can be damaging to brain health. This lesson makes connections and builds on our previous lessons within the Food and Body Module, especially: Nutrition Science Basics, The Digestive and Circulatory Systems as well as Whole Food Plant-Based Eating. In the preparation for this lesson we hope that you will have already covered those core topics as a foundation for Food and the Brain.

Acknowledgements: Lesson plan developed in collaboration with Sara Subhani



Module 2: Food and the Body

Food and the Brain

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LESSON RESOURCES

greenbeetz.org

our website hosts lesson slides, google forms, lesson videos, and teacher training videos, glossary, standards alignment and more

Worksheets

- Be a Brainiac with Teacher Guide
- Brain Boosting Meal Creation

FOOD AND THE BRAIN: AT A GLANCE



ESSENTIAL QUESTION

How does food impact your mental health?



STUDENT LEARNING GOALS AND OBJECTIVES

After this lesson students will be able to:

- Understand the connection between our digestive system and our brain.
- Understand how food can affect your mental health and the benefits of eating certain foods for a healthy brain.
- Recognize foods which may negatively impact brain health and why.



VOCABULARY

- **Mediterranean diet** – A Mediterranean diet favors fruits and vegetables, whole grains, lean protein, omega-3 fatty acids and other healthy fats, and spices. It discourages or limits the consumption of processed foods and red meats.
- **Gut-Brain Axis (GBA)** – The two-way communication between our digestive system and brain, which is influenced by the foods we feed the bacteria, fungus and other microorganisms that live throughout our Digestive Tract (**the gut microbiota**).
- **Nutritional Psychiatry** – the practice of investigating how foods affect our brain health and using food and food supplements as treatments for mental health disorders.
- **Mental Health** – Mental health concerns the state of your emotions, mind, and social well-being. Mental health affects how we think, feel, and act. It also helps determine how we handle stress, relate to others, and make healthy choices.



KEY POINTS

- The brain controls functions that influence our everyday life, like emotions and thinking. The field of Nutritional Psychiatry investigates *how* the food we eat affects our brain.
- The gut (digestive system) is referred to as our **second brain** for a reason. There is a two-way line of communication between our brain and gut called the Gut-Brain Axis. The same signals that control brain functioning (emotions and thinking) are also released from our digestive tract.
- Diets containing lots of processed and ultra-processed foods and trans-fats have been shown to cause depression and anxiety.
- Salt, sugar and fats, commonly found in ultra-processed foods, can be addictive – they affect our brains the same way that drugs do! Companies intentionally design processed foods so we can't stop eating them and want to buy more.
- A healthy diet, such as the Mediterranean diet or a whole foods plant-based diet, promotes physical health as well as brain health. So eat well, for a healthy body and a healthy mind!

LESSON BREAKDOWN

TIME	ACTIVITY	MATERIALS/RESOURCES
PART 1		
5-7 min	Introduction: Remain Standing	Lesson Slides
5-7 min	Vocab Preview	Lesson Slides
3-8 min	Lesson Video: Food and the Brain	<i>(in development)</i>
5-8 min	Class Discussion	Lesson Slides
10 min	Activity: Be a Brainiac	Worksheet and Teacher Guide
3-5 min	Food Detective Assessment	Exit Card
PART 2		
5 min	Visualization	Lesson Slides
15-20 min	Activity: Brain Boosting Meal Creation	Brain Boosting Meal Creation Worksheet
10 min	Snackz & Factz	Pickled Vegetables
5 min	Test Your Noodle	
5 min	Food Detective Assessment	Exit Card

DETAILED LESSON SCRIPT: PART I

Introduction: Remain standing

5-7 minutes

LESSON SLIDES



Let's get introduced to what foods make up a diet that supports brain health. Have your class begin by standing up. They will mentally answer the following questions with a **yes** or a **no** in their head and if they answer **"NO"** they will take a seat and remain seated throughout the remainder of this activity. You can use these questions or come up with your own to introduce the foods that are part of a healthy brain diet.

- *Did you eat fruit today?*
- *Did you eat a vegetable yesterday or today?*
- *Did you eat a whole grain this week?*
- *Did you eat nuts or seeds this past week?*
- *Have you eaten seafood this week?*

*Those that remain standing can tell you what they ate for each question if you have time, this is also a way to assess that they understood your question and truly had a **"YES"** answer.



Vocabulary Review

5-7 minutes

Mediterranean Diet	A Mediterranean diet favors fruits and vegetables, whole grains, lean protein, omega-3 fatty acids and other healthy fats, and spices. It discourages or limits the consumption of processed foods and red meat.
Gut-Brain Axis (GBA)	The two-way communication between our digestive system and brain, which is influenced by the foods we feed the bacteria, fungus and other microorganisms that live throughout our Digestive Tract (the gut microbiome).
Nutritional Psychiatry	The practice of investigating how foods affect our brain health and using food and food supplements as treatments for mental health disorders.
Mental Health	Mental health concerns the state of your emotions, mind, and social well-being. Mental health affects how we think, feel, and act. It also helps determine how we handle stress, relate to others, and make healthy choices.

Lesson Video: Food and the Brain

3-8 minutes

Differentiation

You should decide which structure will help your students access the information:

- Have students ask questions
- Watch the video more than once, pausing at key moments, etc.
- Or, you can allow their responses to be more open-ended and ask: What surprised you? What was most interesting? What was most important?



Class Discussion

5-8 minutes

Have a partner, group and/or open discussion to address these ideas after the video. Display or refer to the Key Points as needed.

- What are some ways that food is good for brain health, what are some ways that food is bad for brain health?
- Why does food impact your mood and which kinds of foods can protect against mental health problems like anxiety and depression?
- What kind of diet is the best at promoting brain health and what does it consist of?

KEY POINTS

Brain-Gut communication

The gut (digestive system) is referred to as our **second brain** for a reason. There is a two-way line of communication between our brain and gut called the Gut-Brain Axis. The same signals that control brain functioning (emotions and thinking) are also released from our digestive tract. The field of **Nutritional Psychiatry** investigates *how* the food we eat affects our brain.

Limiting Ultra-Processed Foods

A poor diet consisting of ultra-processed foods such as those containing trans-fats, salt, and sugar can put us at risk of developing mental health problems such as depression and anxiety. They can also be addictive and affect our brains the same way drugs do! Companies intentionally design processed foods so we can't stop eating them and want to buy more.

The Best Brain Eating Habits

The best diet to promote brain health is one that consists of whole (unprocessed) foods, a wide variety of vegetables, fruits, and whole grains, healthful fats such as nuts and seeds, fish, and olive oil, moderate amounts of dairy and high quality animal protein. The Mediterranean and Whole Foods Plant-Based diets are examples of eating plans that promote a healthy body *and* a healthy mind!



Activity: Be a Brainiac

10 minutes

Hang up a/the blank chart somewhere in your room or work from your white board. Have your students place the individual foods under the category of foods that “help” promote brain and mental health and foods that “don’t help” promote brain and mental health.

HELP	DON'T HELP	HELP	DON'T HELP
			
			
			
			
			
			

What to write on the board or

This is what it will look like after

SAY

Do our brains eat food? Not directly but when we eat we are feeding the bacteria, fungus, and other microorganisms that live in our Digestive Tract. Those microorganisms then communicate with our brain through the Gut-Brain Axis and our brain health, emotional state (mood), and overall mental health can be greatly affected by what kind of foods we feed those microscopic guys that live in our intestines. Mention the components of diets that promote gut health and therefore brain and mental health. Such diets consist of a wide variety of vegetables, fruits, whole grains and healthy fats (nuts, seeds, and olive oil)

- Which foods do you enjoy that support brain health, mental health, and overall well-being?
- What are some ways to substitute ultra-processed foods in your diet with whole foods?

Food Detective Assessment

3-5 minutes

Have your students answer the following on an Exit Card to assess what they learned about food and the brain today:

- List the 4 food groups associated with promoting a healthy brain and gut and give an example of one food in each group

Answers: **Fruits:** Any fruit, **Vegetables:** Any vegetable, **Whole grains:** examples include quinoa, barley, buckwheat, oats, whole wheat, farro, black and brown rice, etc., **Healthy fats:** examples include nuts, olive oil, fish with omega-3 fatty acids, seeds (pumpkin, sunflower, chia), avocados:

DETAILED LESSON SCRIPT: PART II

Visualization Exercise

5 minutes

DO	ASK/SAY
<p>Have students sit in silence for 5-10 seconds and focus inward on their stomachs and ask themselves: What is it saying? Is it quiet? Is it happy? How do I feel right now? (then have them share or write down their findings)</p>	<p>Next, have a few students share their favorite foods outloud to the class using descriptive words (3 examples of descriptive foods i.e. gooey cheese pizza, strawberry ice cream with sprinkles, enchiladas, mango curry...).</p>
<p>After talking briefly but in detail about a few foods, have your students close their eyes again and focus for 5-10 seconds on their stomach and themselves once more.</p>	<p>Have them open their eyes and share what their stomachs are saying or doing now (grumbling, quiet, etc..) and how are they feeling now (impatient, calm, distracted, hungry, etc?). How has their emotional state changed from the start of this exercise?</p>

Some or most of your students should have said that they are now feeling hungry or maybe distracted when they were not before, and/or their stomachs have started grumbling louder than before, etc. This is an example of how our brains, thinking about food, can affect our guts and our emotions.



Activity: Brain Boosting Meal Creation

15-20 minutes

We are now going to create meals that help power up our brains and boost mental health!

Have your students work in groups to create their own brain-boosting meal made of: whole grains, fruits, vegetables, healthy fats, lean proteins and spices. They can then share their meal with the class and discuss why they choose the foods they did.

Name of your Meal: Rice Bowl

Circle your ingredients in the Food Bank:

Fruit	Vegetables	Legumes	Whole Grains	Protein	Healthy Fats (Unsaturated)	Brainiac Spices
Blueberries	Spinach	Lentils	Oatmeal	Eggs	Walnuts	Ginger
Strawberries	Cucumber	Black beans	Brown rice	Salmon	Olive oil	Garlic
Avocado	Butterbean	Chickpeas	Whole grain bread	Chicken breast	Coconut seeds	Turmeric

Differentiation: You can find images online, have your students draw the food images, or simply write down the words depending on your class and how much time you have to spend on this activity.

Snackz & Factz: Pickled Vegetables

10 minutes

Get an array of pickles for your students to try. Most students have tried pickled cucumbers but may not be so familiar with other pickled vegetables. Have students taste their pickle(s) as you discuss the Snackz and Factz



MATERIALS

- Various pickled vegetables of choice

FACTZ

Pickling food has been practiced for thousands of years and began as a way to preserve it. Pickles are often made from cucumbers (but anything can be pickled - even eggs!) which are high in fiber. And fiber is one of the best foods for our “good” gut microbiome.

A pickle is another way to prepare and enjoy vegetables and other foods! Most store-bought pickles are made from a mixture of vinegar and salt that preserves the food. Some pickles are fermented and made from a salt-water solution. Fermented Pickles are an added bonus for your gut. They offer additional food to your gut that help promote the health of the bacteria living in your Digestive Tract, but it can be hard to find fermented pickles on grocery store shelves. Check the label to see if your pickles contain vinegar or sugar in the ingredient list, if it does, then it’s not fermented.

Test Your Noodle

5 minutes

1. Select the following foods that support a healthy brain

- a. Bananas
- b. Avocados
- c. Peanut Butter
- d. Sunflower Seeds

e. Chicken Nuggets

- f. Quinoa
- g. Whole Foods

2. Select the following foods that don't support a healthy brain

- a. Fruit Snacks
- b. Chicken Nuggets

c. Tofu

d. Broccoli

e. French Fries

f. Pickles

g. Processed Foods

3. Why are ultra-processed foods addictive? **(Due to their combination of sugars, fats, and salt that is not found naturally in any whole foods.)**

4. True or False: Diets containing lots of ultra processed foods have been shown to cause depression and anxiety. **(True)**

5. True or False: What we eat affects how we feel. **(True)**

Food Detective Assessment

5 minutes

Have your students answer the following on an Exit Card to assess what they learned about food and the brain:

- *Explain what the Gut-Brain Axis is and list some things you can do to support your own brain health.*



Activity: Be a Brainiac

Do our brains eat food? Not directly but when we eat we are feeding the bacteria, fungus, and other microorganisms that live in our digestive tract. Those microorganisms then communicate with our brain through the Gut-Brain Axis and our brain health, emotional state (mood) and overall mental health can be greatly affected by what kind of foods we feed those microscopic guys that live in our intestines.

In this activity you will identify foods that HELP vs. DON'T HELP boost our brain health.

- **HELP** - These are foods that support our wellbeing, mental health, and brain health. They are healthy choices that should be the biggest part of our meals and snacks.

- **DON'T HELP** - These are foods that make us feel good in the moment when we eat them but they do not support our well-being and mental health over time. We can enjoy them, but less often.

TIP - the 4 categories of powerful brain foods are: vegetables, fruits, whole grains and healthy fats (nuts, seeds, and olive oil).

HELP	DON'T HELP

This is what to write on the board or chart paper before you start the lesson.

HELP	DON'T HELP
	

This is what it will look like after you sort the cards into those that HELP promote brain health vs. those that DON'T HELP promote brain health.

Discussion questions for consideration.

1. Which foods do you enjoy that support brain health, mental health, and overall well-being?
2. What are some ways to substitute ultra processed foods in your diet with whole foods?



Activity: Be a Brainiac — Foods that Don't Help



Chicken nuggets



Fruit snacks



Chips



Frozen pizza



Sugary yogurt (with candy toppings)



Hershey's chocolate



Activity: Be a Brainiac — Foods that Help



Sauerkraut



Brazil nuts



Leafy green vegetables



Avocados



Turmeric chickpeas



Dark Chocolate made with 70% cacao



Activity: Brain Boosting Meal Creation

Create your own brain boosting Meal using whole grains, fruits, vegetables, healthy fats, lean proteins and spices using the FOOD BANK below as a guide (pick some of your favorites not listed if you like!) and **draw or describe** your meal in the space below.

After you made your meal: *Do you think you can make this meal at home or something similar?*

Name of your Meal: _____

Circle your ingredients in the Food Bank:

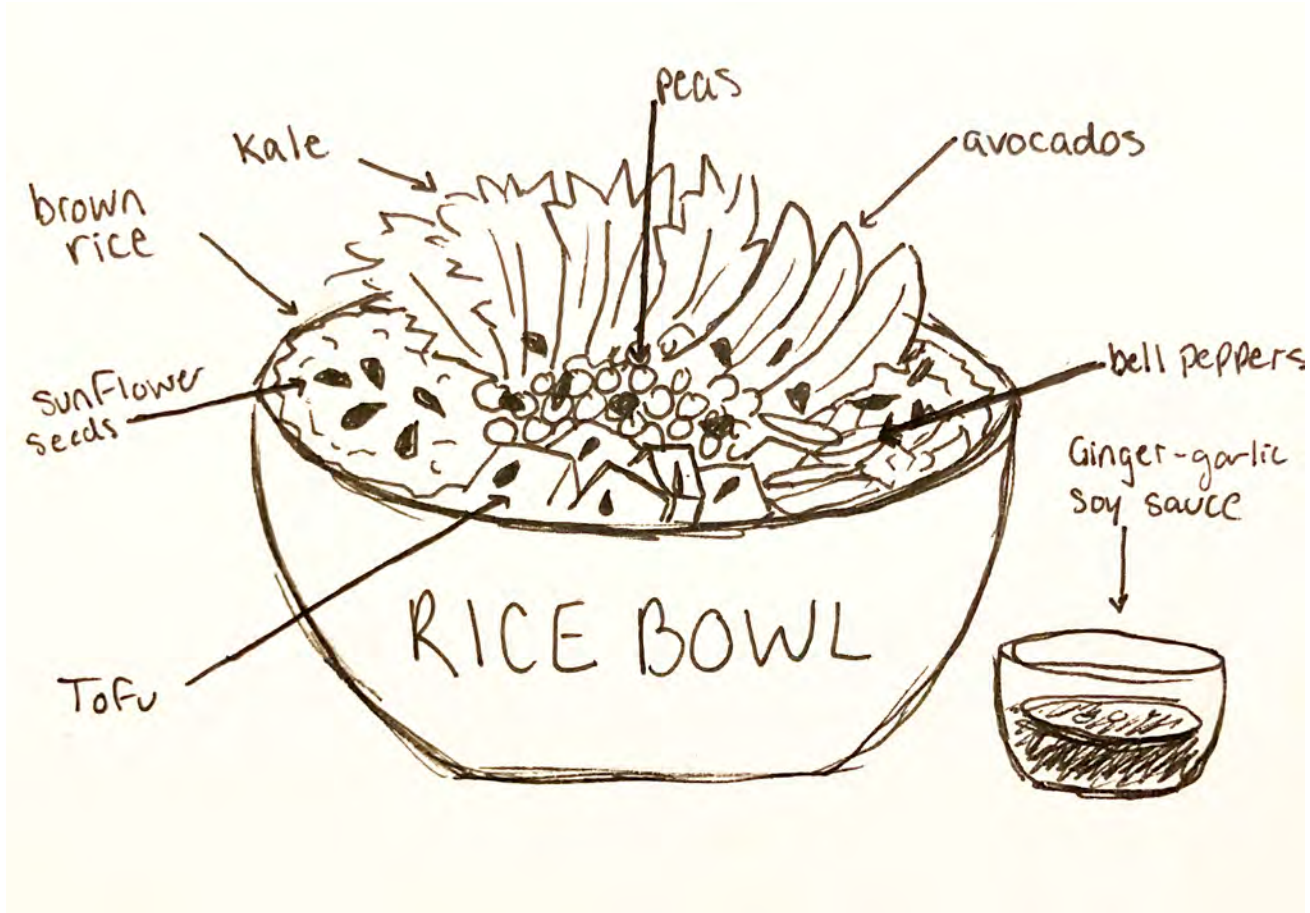
Fruit	Vegetables	Legumes	Whole Grains	Protein	Healthy Fats (Unsaturated)	Brainiac Spices
Blueberries	Spinach	Lentils	Quinoa	Eggs	Walnuts	Ginger
Strawberries	Cucumber	Black beans	Brown rice	Salmon	Olive oil	Garlic
Avocados	Bell pepper	Chickpeas	Whole grain bread	Chicken breast	Sunflower seeds	Turmeric
Oranges	Broccoli	Peas	Whole grain oats	Tofu	Chia seeds	Nutmeg
Kiwi	Kale	Kidney beans	Chickpea pasta	Pinto beans	Almonds	Cinnamon



Activity: Brain Boosting Meal Creation (EXAMPLE)

Create your own brain boosting Meal using whole grains, fruits, vegetables, healthy fats, lean proteins and spices using the FOOD BANK below as a guide (pick some of your favorites not listed if you like!) and **draw or describe** your meal in the space below.

After you made your meal: *Do you think you can make this meal at home or something similar?*



Name of your Meal: Rice Bowl

Circle your ingredients in the Food Bank:

Fruit	Vegetables	Legumes	Whole Grains	Protein	Healthy Fats (Unsaturated)	Brainiac Spices
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Oranges	Broccoli	Peas	Whole grain oats	Tofu	Chia seeds	Nutmeg
Kiwi	Kale	Kidney beans	Chickpea pasta	Pinto beans	Almonds	Cinnamon