# Student Baseline Survey

The following survey was used to gauge student baseline knowledge and attitudes for an experiment that accompanied the development of this curriculum.

**Directions:** Read each question carefully and answer to the best of your ability. This first page is designed to find out what you already know about ocean acidification. You will have another opportunity when we finish to demonstrate what you learned. This is not a test and you are not being graded.

1. How much, if anything, would you say you know about ocean acidification? (*check one answer*)
   * I have not heard of ocean acidification
   * I have heard of ocean acidification, but I know almost nothing about it
   * I know just a little about ocean acidification
   * I know a fair amount about ocean acidification
   * I know a great deal about ocean acidification
2. Which, if any, do you think is the **main cause** of ocean acidification? (*check one answer*)
   * Carbon dioxide in the atmosphere that is naturally-occurring being absorbed by the ocean
   * Carbon dioxide in the atmosphere from human activities being absorbed by the ocean
   * Increased sea water temperatures from climate change
   * Normal cycles of change in ocean chemistry
   * Over-fishing (catching too many fish) leading to disruption of ocean food chains
   * Pollution, such as from oil spills and discharge of waste
   * None of these
   * I don’t know

Which, if any, do you think are **possible consequences** of ocean acidification? (*check all that apply*)

Worse conditions for some larger marine organisms (including fish)

Better conditions for some larger marine organisms (including fish)

Worse conditions for some small marine organisms

Better conditions for some small marine organisms

The ocean will become acidic (below pH = 7)

Coral reefs will grow more slowly

Most living marine animals will have their shells completely dissolve

Making and repairing shells will require more energy

Making and repairing shells will require less energy

There will be problems, such as decreased profits, for people who make a living from the sea

People spending long periods of time at sea, such as fishermen, will have skin damage

The metal hulls of ships will be damaged

None of the above

I don’t know

**Directions:** Read each question carefully and answer honestly. The following questions ask how you think and feel, so there are no right or wrong answers.

Definition: *An “estuary” is a water passage where ocean tides meet a river. Examples include Yaquina Bay, Siletz Bay, and Alsea Bay*.

1. How concerned, if at all, are you about ocean acidification? (*check one answer*)
   * Not at all concerned
   * Not very concerned
   * Fairly concerned
   * Very concerned
   * I don’t know

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Read each statement and show how much you agree or disagree by ***circling one number*** for each statement. | | | | | | |
|  | **Strongly disagree** | **Somewhat disagree** | **Neither agree nor disagree** | **Somewhat agree** | **Strongly agree** | **I don’t know** | |
| 1. Ocean acidification is happening in my **local estuary** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification is happening along the **U.S. West Coast** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification is happening **globally** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. The ocean is **too big** to be harmed by humans | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification is a **threat** to overall ocean health | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification has consequences for people **today** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification will have consequences for people within **my lifetime** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification will have consequences for **me** within **my lifetime** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification will have consequences for **future generations** | 1 | 2 | 3 | 4 | 5 | 0 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Read each statement and show how much you agree or disagree by ***circling one number*** for each statement. | | | | | | |
|  | **None at all** | **Very little** | **A moderate amount** | **A lot** | **A great deal** | **I don’t know** |
| 1. How much control do you feel that **you, alone**, have in reducing ocean acidification in your **local estuary**? | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. How much control do you feel that **you, alone**, have in reducing ocean acidification in the **global ocean**? | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. How much control do you feel that **you, working with others**, have in reducing ocean acidification in your **local estuary**? | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. How much control do you feel that **you, working with others**, have in reducing ocean acidification in the **global ocean**? | 1 | 2 | 3 | 4 | 5 | 0 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Read each statement and show how much you agree or disagree by ***circling one number*** for each statement. | | | | | | | | |
|  | **Strongly disagree** | **Somewhat disagree** | **Neither agree nor disagree** | **Somewhat agree** | **Strongly agree** | **I Don’t Know** | | |
| 1. Reducing ocean acidification is the **right thing** to do | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. **People** should be taking action to reduce ocean acidification | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. **I** should be taking action to reduce ocean acidification | 1 | 2 | 3 | 4 | 5 | 0 |

1. Which people, if any, do you think should be taking action to reduce ocean acidification?

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1. Explain why you think these people, in particular, should be taking action.

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1. **List** **actions** someone **could take** to reduce ocean acidification. Then, **circle** the number that shows how often you **currently** do each action.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action** | I **never** do this | I **rarely** do this | I **sometimes** do this | I **regularly** do this |
|  | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 |

1. Do you have any final comments?

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*Thank you!*

# Student Post Survey

The following survey was used to gauge student knowledge and attitudes post instruction for an experiment that accompanied the development of this curriculum.

**Directions:** Read each question carefully and answer to the best of your ability. This first page is designed to find out what you already know about ocean acidification. You will have another opportunity when we finish to demonstrate what you learned. This is not a test and you are not being graded.

1. Were you present for the following classes? (check all that apply)

* Day 1: Introduction to ocean acidification [insert date]
* Day 2: Chemistry of ocean acidification [insert date]
* Day 3: Impacts of ocean acidification [insert date]
  + Day 4: Experiment: Shells in acid / Solutions to ocean acidification [insert date]

1. How much, if anything, would you say you know about ocean acidification? (*check one answer*)
   * I have not heard of ocean acidification
   * I have heard of ocean acidification, but I know almost nothing about it
   * I know just a little about ocean acidification
   * I know a fair amount about ocean acidification
   * I know a great deal about ocean acidification
2. Which, if any, do you think is the **main cause** of ocean acidification? (*check one answer*)
   * Carbon dioxide in the atmosphere that is naturally-occurring being absorbed by the ocean
   * Carbon dioxide in the atmosphere from human activities being absorbed by the ocean
   * Increased sea water temperatures from climate change
   * Normal cycles of change in ocean chemistry
   * Over-fishing (catching too many fish) leading to disruption of ocean food chains
   * Pollution, such as from oil spills and discharge of waste
   * None of these
   * I don’t know

Which, if any, do you think are **possible consequences** of ocean acidification? (*check all that apply*)

Worse conditions for some larger marine organisms (including fish)

Better conditions for some larger marine organisms (including fish)

Worse conditions for some small marine organisms

Better conditions for some small marine organisms

The ocean will become acidic (below pH = 7)

Coral reefs will grow more slowly

Most living marine animals will have their shells completely dissolve

Making and repairing shells will require more energy

Making and repairing shells will require less energy

There will be problems, such as decreased profits, for people who make a living from the sea

People spending long periods of time at sea, such as fishermen, will have skin damage

The metal hulls of ships will be damaged

None of the above

I don’t know

**Directions:** Read each question carefully and answer honestly. The following questions ask how you think and feel, so there are no right or wrong answers.

Definition: *An “estuary” is a water passage where ocean tides meet a river. Examples include Yaquina Bay, Siletz Bay, and Alsea Bay*.

1. How concerned, if at all, are you about ocean acidification? (*check one answer*)
   * Not at all concerned
   * Not very concerned
   * Fairly concerned
   * Very concerned
   * I don’t know

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Read each statement and show how much you agree or disagree by ***circling one number*** for each statement. | | | | | | | |
|  | **Strongly disagree** | **Somewhat disagree** | **Neither agree nor disagree** | **Somewhat agree** | **Strongly agree** | **I don’t know** |
| 1. Ocean acidification is happening in my **local estuary** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification is happening along the **U.S. West Coast** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification is happening **globally** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. The ocean is **too big** to be harmed by humans | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification is a **threat** to overall ocean health | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification has consequences for people **today** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification will have consequences for people within **my lifetime** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification will have consequences for **me** within **my lifetime** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification will have consequences for **future generations** | 1 | 2 | 3 | 4 | 5 | 0 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Read each statement and show how much you agree or disagree by ***circling one number*** for each statement. | | | | | | | |
|  | **None at all** | **Very little** | **A moderate amount** | **A lot** | **A great deal** | **I don’t know** |
| 1. How much control do you feel that **you, alone**, have in reducing ocean acidification in your **local estuary**? | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. How much control do you feel that **you, alone**, have in reducing ocean acidification in the **global ocean**? | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. How much control do you feel that **you, working with others**, have in reducing ocean acidification in your **local estuary**? | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. How much control do you feel that **you, working with others**, have in reducing ocean acidification in the **global ocean**? | 1 | 2 | 3 | 4 | 5 | 0 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Read each statement and show how much you agree or disagree by ***circling one number*** for each statement. | | | | | | | |
|  | **Strongly disagree** | **Somewhat disagree** | **Neither agree nor disagree** | **Somewhat agree** | **Strongly agree** | **I Don’t Know** | |
| 1. Reducing ocean acidification is the **right thing** to do | 1 | 2 | 3 | 4 | 5 | 0 | |
| 1. **People** should be taking action to reduce ocean acidification | 1 | 2 | 3 | 4 | 5 | 0 | |
| 1. **I** should be taking action to reduce ocean acidification | 1 | 2 | 3 | 4 | 5 | 0 | |

1. Which people, if any, do you think should be taking action to reduce ocean acidification?

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1. Explain why you think these people, in particular, should be taking action.

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1. **List** **actions** someone **could take** to reduce ocean acidification. Then, **circle** the number that shows how often you **currently** do each action.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Currently…** | | | | **In the future…** | | | |
|  |  | | | |  | | | |
| **Action** | I **never** do this | I **rarely** do this | I **sometimes** do this | I **regularly** do this | I **never** plan to do this | I plan to do this **rarely** | I plan to do this **sometimes** | I plan to do this **regularly** |
|  | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |

1. Do you have any final comments?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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*Thank you!*

# Student Follow-up Survey

The following survey was used to gauge student knowledge and attitudes 10-weeks after instruction for an experiment that accompanied the development of this curriculum.

**Directions:** Read each question carefully and answer to the best of your ability. This first page is designed to find out what you already know about ocean acidification. You will have another opportunity when we finish to demonstrate what you learned. This is not a test and you are not being graded.

1. How much, if anything, would you say you know about ocean acidification? (*check one answer*)
   * I have not heard of ocean acidification
   * I have heard of ocean acidification, but I know almost nothing about it
   * I know just a little about ocean acidification
   * I know a fair amount about ocean acidification
   * I know a great deal about ocean acidification
2. Which, if any, do you think is the **main cause** of ocean acidification? (*check one answer*)
   * Carbon dioxide in the atmosphere that is naturally-occurring being absorbed by the ocean
   * Carbon dioxide in the atmosphere from human activities being absorbed by the ocean
   * Increased sea water temperatures from climate change
   * Normal cycles of change in ocean chemistry
   * Over-fishing (catching too many fish) leading to disruption of ocean food chains
   * Pollution, such as from oil spills and discharge of waste
   * None of these
   * I don’t know

Which, if any, do you think are **possible consequences** of ocean acidification? (*check all that apply*)

Worse conditions for some larger marine organisms (including fish)

Better conditions for some larger marine organisms (including fish)

Worse conditions for some small marine organisms

Better conditions for some small marine organisms

The ocean will become acidic (below pH = 7)

Coral reefs will grow more slowly

Most living marine animals will have their shells completely dissolve

Making and repairing shells will require more energy

Making and repairing shells will require less energy

There will be problems, such as decreased profits, for people who make a living from the sea

People spending long periods of time at sea, such as fishermen, will have skin damage

The metal hulls of ships will be damaged

None of the above

I don’t know

**Directions:** Read each question carefully and answer honestly. The following questions ask how you think and feel, so there are no right or wrong answers.

Definition: *An “estuary” is a water passage where ocean tides meet a river. Examples include Yaquina Bay, Siletz Bay, and Alsea Bay*.

1. How concerned, if at all, are you about ocean acidification? (*check one answer*)
   * Not at all concerned
   * Not very concerned
   * Fairly concerned
   * Very concerned
   * I don’t know

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Read each statement and show how much you agree or disagree by ***circling one number*** for each statement. | | | | | | |
|  | **Strongly disagree** | **Somewhat disagree** | **Neither agree nor disagree** | **Somewhat agree** | **Strongly agree** | **I don’t know** | |
| 1. Ocean acidification is happening in my **local estuary** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification is happening along the **U.S. West Coast** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification is happening **globally** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. The ocean is **too big** to be harmed by humans | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification is a **threat** to overall ocean health | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification has consequences for people **today** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification will have consequences for people within **my lifetime** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification will have consequences for **me** within **my lifetime** | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. Ocean acidification will have consequences for **future generations** | 1 | 2 | 3 | 4 | 5 | 0 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Read each statement and show how much you agree or disagree by ***circling one number*** for each statement. | | | | | | |
|  | **None at all** | **Very little** | **A moderate amount** | **A lot** | **A great deal** | **I don’t know** |
| 1. How much control do you feel that **you, alone**, have in reducing ocean acidification in your **local estuary**? | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. How much control do you feel that **you, alone**, have in reducing ocean acidification in the **global ocean**? | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. How much control do you feel that **you, working with others**, have in reducing ocean acidification in your **local estuary**? | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. How much control do you feel that **you, working with others**, have in reducing ocean acidification in the **global ocean**? | 1 | 2 | 3 | 4 | 5 | 0 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Read each statement and show how much you agree or disagree by ***circling one number*** for each statement. | | | | | | | |
|  | **Strongly disagree** | **Somewhat disagree** | **Neither agree nor disagree** | **Somewhat agree** | **Strongly agree** | **I Don’t Know** |
| 1. Reducing ocean acidification is the **right thing** to do | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. **People** should be taking action to reduce ocean acidification | 1 | 2 | 3 | 4 | 5 | 0 |
| 1. **I** should be taking action to reduce ocean acidification | 1 | 2 | 3 | 4 | 5 | 0 |

1. Which people, if any, do you think should be taking action to reduce ocean acidification?

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1. Explain why you think these people, in particular, should be taking action.

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **In the past 3 months…** | | | | **In the future…** | | | |
|  |  | | | |  | | | |
| **Action** | I **never** did this | I **rarely** did this | I **sometimes** did this | I **regularly** did this | I **never** plan to do this | I plan to do this **rarely** | I plan to do this **sometimes** | I plan to do this **regularly** |
|  | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
|  | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |

1. Do you have any final comments?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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*Thank you!*