Environmental Literacy Instrument for Adolescents

*Directions for Use and Scoring Guide*

Thank you for your interest in utilizing the Environmental Literacy Instrument for Adolescents. This instrument was designed for adolescents (ages 13-18) in North Carolina, U.S.A. and to be used before and after a semester-long-program to measure changes over time, although it can be used a single time. It is short enough for field-use and testing has shown it takes students 5-15 minutes to complete, on average.

You may edit the questions to make them relevant and place-based for students, where appropriate. For example, Ecological Knowledge question 4 states: “There are 150 longleaf pine trees per square kilometer in a certain area of the NC Sandhills. To which population characteristic does this information refer?” If you decided to change this question, we recommend that the species (longleaf pine) and place (NC Sandhills) be changed to a species and location that coincides with where the majority of your participants are from. However, please be aware any edits made could affect the final results. We suggest editing Section 1, question 4 and Section 3. The words we suggest editing are underlined in the instrument

This tool is divided into five parts: the four components of environmental literacy (ecological knowledge, environmental hope, cognitive skills, behavior) and a demographic section. Please add or take away from the demographic section as appropriate for your purposes. Below is the appropriate scoring for each section. A scoring form can be found at the end of the document to aid you in scoring, however, we recommend creating a spreadsheet for quicker scoring of large groups.

For additional information on instrument development, please see the full manuscript:

Szczytko, R., Stevenson, K., Peterson, M. N., Nietfeld, J., & Strnad, R. L. (2018). Development and Validation of the Environmental Literacy Instrument for Adolescents. Environmental Education Research, 1–19. http://doi.org/10.1080/13504622.2018.1487035

*Scoring Guide*

PART ONE: ECOLOGICAL KNOWLEDGE

Students get 1 point for each correct answer. The ten items are summed together to create a total score (ranging from 0 to 10). The total score is then multiplied by 2.5. This is their ecological knowledge score.

Correct answers are as follows:

1. D
2. C
3. A
4. D
5. A
6. A
7. A
8. D
9. B
10. A

Example:

Student A gets 4 items correct and 6 incorrect. Student A has a total score of 4. 4\* 2.5= 10. 10 is Student A’s ecological knowledge score.

PART TWO: ENVIRONMENTAL HOPE

Students receive 1 to 5 points, depending on their response. The response to each item is summed (totals will range from 11 to 55). The total is multiplied by 0.455.

Scoring is as follows:

Strongly Disagree = 1 point

Disagree = 2 points

Neutral = 3 points

Agree = 4 points

Strongly Agree = 5 points

Example:

Student A strongly disagrees with 3 items, disagrees with 2 item, is neutral on 2 items, agrees with 4 items, and strongly agrees with 0 items. Student A has a total score of 29 ([3\*1] + [2\*2] + [2\*3] + [4\*4] + [0\*5]). 29 \* 0.455 = 13.195. 13.195 is Student A’s environmental hope score.

PART THREE: COGNITIVE SKILLS

Student responses are given a value of 1 to 5 (1 for most important, 2 for second most important, etc.). The value for each student response is subtracted from the expert ranking; their absolute values are summed together to determine a total score. (Note: A table of all possible scores has been provided for each question on the scoring sheet, but we provide the entire scoring process here for transparency). The total score is then subtracted from 12.8 and multiplied by 2.118, to give the final cognitive skills score.

Expert scores are as follows:

* What do striped bass fishers use for bait?
  + Least important (5 points)
* What has been the numbers of new striped bass entering the population each year?
  + Most important (1 point)
* What are the most important foods striped bass eat?
  + Third most important (3.4 points)
* What size are the striped bass that can successful reproduce?
  + Second most important (2.4 points)
* Do predators eat juvenile striped bass?
  + Fourth most important (3.8 points)

Example:

Student A ranks the questions as follows:

* What do striped bass fishers use for bait?
  + Least important (5)
* What has been the numbers of new striped bass entering the population each year?
  + Most important (1)
* What are the most important foods striped bass eat?
  + Second most important (2)
* What size are the striped bass that can successful reproduce?
  + Fourth most important (4)
* Do predators eat juvenile striped bass?
  + Third most important (3)

Student A has a total score of 3.8 (|5-5| + |1-1| + |2-3.4| + |4-2.4| + |3-3.8|). (12.8-3.8) \* 2.118 = 19.062. 19.062 is Student A’s cognitive skill score.

PART FOUR: BEHAVIOR

Students receive 1 to 5 points, depending on their response. The response to each item is summed (totals will range from 6 to 30).

Scoring is as follows:

Never = 1 point

Rarely = 2 points

Sometimes = 3 points

Often = 4 points

Always = 5 points

Example:

Student A selects “Never” for 2 items, “Rarely” for 1 item, “Sometimes” on 1 item, “Often” on 0 items, and “Always” on 2 items. Student A has a total score of 17 ([2\*1] + [1\*2] + [1\*3] + [0\*4] + [2\*5]). 17 is Student A’s behavior score.

TOTAL ENVIRONMENTAL LITERACY SCORE

Students’ ecological knowledge, environmental hope, cognitive skills, and behavior scores are summed together to determine their environmental literacy score (out of 100). We recommend rounding to the nearest tenths-place decimal.

Example:

Student A received:

Ecological knowledge = 10

Environmental hope = 13.195

Cognitive skills = 19.062

Behavior =17

Student A’s total environmental literacy score is 59.257 out of 100. Rounding, the score is 59.3.

Environmental Literacy Instrument for Adolescents

*Scoring Sheet*

PART ONE: ECOLOGICAL KNOWLEDGE

Students get 1 point for each correct answer. Write the number of points received in the blank next to the question.

1. \_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_
5. \_\_\_\_\_\_\_\_\_\_
6. \_\_\_\_\_\_\_\_\_\_
7. \_\_\_\_\_\_\_\_\_\_
8. \_\_\_\_\_\_\_\_\_\_
9. \_\_\_\_\_\_\_\_\_\_
10. \_\_\_\_\_\_\_\_\_\_

Sum: \_\_\_\_\_\_\_\_\_\_\_\_ x 2.5 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ecological Knowledge Score

PART TWO: ENVIRONMENTAL HOPE

Write the total number of responses given in each blank. Multiply by the value to get a response score. Add all scores, and multiply by 0.455 to get the final environmental hope score.

|  |  |  |  |
| --- | --- | --- | --- |
| Strongly Disagree | \_\_\_\_\_\_\_\_\_\_ | x 1 = | \_\_\_\_\_\_\_\_\_\_ |
| Disagree | \_\_\_\_\_\_\_\_\_\_ | x 2 = | \_\_\_\_\_\_\_\_\_\_ |
| Neutral | \_\_\_\_\_\_\_\_\_\_ | x 3 = | \_\_\_\_\_\_\_\_\_\_ |
| Agree | \_\_\_\_\_\_\_\_\_\_ | x 4 = | \_\_\_\_\_\_\_\_\_\_ |
| Strongly Agree | \_\_\_\_\_\_\_\_\_\_ | x 5 = | \_\_\_\_\_\_\_\_\_\_ |

Sum: \_\_\_\_\_\_\_\_\_\_\_\_ x 0.455 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Environmental Hope Score

PART THREE: COGNITIVE SKILLS

Locate the student ranking and the associated score for each question. Sum all five scores together, subtract from 12.8, and multiply by 2.118 to get a final cognitive skills score.

* What do striped bass fishers use for bait?

|  |  |
| --- | --- |
| Student Ranking | Score |
| 1 | 4 |
| 2 | 3 |
| 3 | 2 |
| 4 | 1 |
| 5 | 0 |

* What have been the numbers of new striped bass entering the population each year?

|  |  |
| --- | --- |
| Student Ranking | Score |
| 1 | 0 |
| 2 | 1 |
| 3 | 2 |
| 4 | 3 |
| 5 | 4 |

* What are the most important foods striped bass eat?

|  |  |
| --- | --- |
| Student Ranking | Score |
| 1 | 2.4 |
| 2 | 1.4 |
| 3 | 0.4 |
| 4 | 0.6 |
| 5 | 1.6 |

* What size are the striped bass that can successful reproduce?

|  |  |
| --- | --- |
| Student Ranking | Score |
| 1 | 1.4 |
| 2 | 0.4 |
| 3 | 0.6 |
| 4 | 1.6 |
| 5 | 2.6 |

* Do predators eat juvenile striped bass?

|  |  |
| --- | --- |
| Student Ranking | Score |
| 1 | 2.8 |
| 2 | 1.8 |
| 3 | 0.8 |
| 4 | 0.2 |
| 5 | 1.2 |

12.8 - \_\_\_\_\_\_\_\_\_ x 2.118 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sum

Cognitive Skills Score

PART FOUR: BEHAVIOR

Write the total number of responses given in each blank. Multiply by the value to get a response score. Add all response scores to get the final behavior score.

|  |  |  |  |
| --- | --- | --- | --- |
| Never | \_\_\_\_\_\_\_\_\_\_ | x 1 = | \_\_\_\_\_\_\_\_\_\_ |
| Rarely | \_\_\_\_\_\_\_\_\_\_ | x 2 = | \_\_\_\_\_\_\_\_\_\_ |
| Sometimes | \_\_\_\_\_\_\_\_\_\_ | x 3 = | \_\_\_\_\_\_\_\_\_\_ |
| Often | \_\_\_\_\_\_\_\_\_\_ | x 4 = | \_\_\_\_\_\_\_\_\_\_ |
| Always | \_\_\_\_\_\_\_\_\_\_ | x 5 = | \_\_\_\_\_\_\_\_\_\_ |

Sum: \_\_\_\_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Behavior Score

ENVIRONMENTAL LITERACY SCORE

\_\_\_\_\_\_\_\_\_\_\_\_\_\_+\_\_\_\_\_\_\_\_\_\_\_\_\_\_+\_\_\_\_\_\_\_\_\_\_\_\_\_\_+\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_\_

Environmental Literacy Score

Behavior Score

Cognitive Skills Score

Environmental Hope Score

Ecological Knowledge Score