



## Explore, Lesson #2: “Healthy Environment, Healthy You”

These materials are all part of EPA Report #: EPA/600/R-18/231.

### Time Consideration

**Prep time:** 0-5 minutes, **Activity time:** anywhere from 15-60 minutes

### Materials

Printed handouts, clipboards, writing utensils, an area outside to observe the environment

### Teacher Preparation

1. Print all of the “**Healthy Environment, Healthy You**” **Journal Prompts**. There are three Journal Prompt topics: happiness, anxiety, and self-esteem. **All of the Journal Prompts cards can be found in the Appendix.**
2. Get writing utensils for all of the students.
3. Place the Journal Prompts on clipboards with writing utensils for the students to use. Having the students work independently is recommended.
  - **Option 1:** Give out all three prompts to 3 groups of students.
  - **Option 2:** Give the same prompts to all of the students and conduct the activity 3 times during the school year.

### Procedure

1. Deliver background information on ecosystem services. Some teachers prefer not to prompt the students ahead of time about ecosystem services so that the students will not be biased when they write about topics from the **Journal Prompts** outside. Choose what works best for you and your students. At some point, talk with students about the concept of **ecosystem services: providing the benefits that humans receive from nature**. Have students provide examples of ecosystem services and related human benefits.

*Examples of ecosystem services: trees provide oxygen which we breathe; trees provide shade on the playground (US EPA 2008); wetlands filter water (Vellidis et al., 2003); forests provide places for people to recreate (Kline et al., 2011).*



*Examples of human benefits: reductions in stress and anxiety from spending time at the beach (MacKerron & Mourato 2013); reduced symptoms of post-traumatic stress disorder after spending a weekend fly-fishing by the river (Vella et al., 2013).*

2. Explain that you’re going outdoors for a nature journaling activity. Once outside, walk to a quiet, natural environment near your school (fields, meadows, beside creeks, and woods work well). After cautioning students about ticks, poison ivy, fire ants, etc., tell students to sit quietly for a little bit first (~5 minutes) and observe sensations through their eyes, ears, noses and skin.
3. After ~5 minutes, have the students work on Part 1 (Ecosystem Location) and Part 2 (Ecosystem Evaluation).
4. When they are finished with Parts 1 & 2, have the students begin Part 3 (Journal Prompt). Remind them that their answers can be private and that participation in the discussion afterwards is optional.
5. Back in the classroom, if students are willing to share, have them discuss their responses.
6. Pull up the **“Healthy Environment, Healthy You”: List of Associations for Group Discussion**. Guide students through some of the associations or let them read and reflect on them privately. If you have split students into groups with different Journal Prompts, this is a good opportunity to break them into three smaller groups based on their assigned prompts (happiness, anxiety, or self-esteem) for small-group discussions prior to a whole-class group discussion.
7. **Evaluate:** During the group discussions, evaluate student understanding of the connections between the environment and human health.

All studies cited above and in the **“Healthy Environment, Healthy You”: List of Associations for Group Discussion** are featured in the online EnviroAtlas Eco-Health Relationship Browser: <https://www.epa.gov/enviroatlas/enviroatlas-eco-health-relationship-browser>.





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Feel free to use the space below for sketching/drawing.

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**Part 4. Small-group discussion on associations and large-group discussion on overall theme.**

Below, write any interesting facts or new things that you learned during the discussions.



# Healthy Environment, Healthy You: Anxiety

"It's not what you look at that matters. It's what you see." -Henry David Thoreau

Name(s): \_\_\_\_\_ Date: \_\_\_\_\_

Location: \_\_\_\_\_

## Part 1. Ecosystem Location

Check all applicable ecosystem descriptions:

- |  |   |                                       |
|--|---|---------------------------------------|
| <input type="checkbox"/> Wetlands        | <input type="checkbox"/> Field/Meadow       | <input type="checkbox"/> Business     |
| <input type="checkbox"/> Agro-Ecosystem  | <input type="checkbox"/> Lake/Pond          | Area/Parking lot                      |
| <input type="checkbox"/> Urban Ecosystem | <input type="checkbox"/> Stream/Creek/River | <input type="checkbox"/> Neighborhood |
| <input type="checkbox"/> Forest          | <input type="checkbox"/> Shrub area         | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Desert          | <input type="checkbox"/> School/Playground  |                                       |
| <input type="checkbox"/> Ocean           | <input type="checkbox"/> Park               |                                       |

Briefly describe the ecosystem: \_\_\_\_\_

Major vegetation (trees, shrubs, etc.): \_\_\_\_\_

What wildlife might you expect to see here? \_\_\_\_\_

Any animals (including birds) seen on site: \_\_\_\_\_

## Part 2. Associations between Aesthetics & Engagement with Nature and Happiness

### JOURNALING ASSIGNMENT:

Anxiety is worrying too much about everyday things. There are different types of anxiety, including sometimes feeling panicked.

**If you ever felt anxious or panicked, what are three ways that you could overcome that feeling?**

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**Part 4. Small-group discussion on associations and large-group discussion on overall theme.**

Below, write any interesting facts or new things that you learned during the discussions.



# Healthy Environment, Healthy You: Self-Esteem

"It's not what you look at that matters. It's what you see." -Henry David Thoreau

Name(s): \_\_\_\_\_ Date: \_\_\_\_\_

Location: \_\_\_\_\_

## Part 1. Ecosystem Location

Check all applicable ecosystem descriptions:

- Wetlands
- Agro-Ecosystem
- Urban Ecosystem
- Forest
- Desert
- Ocean
- Field/Meadow
- Lake/Pond
- Stream/Creek/River
- Shrub area
- School/Playground
- Park
- Business Area/Parking lot
- Neighborhood
- Other: \_\_\_\_\_

Briefly describe the ecosystem: \_\_\_\_\_

Major vegetation (trees, shrubs, etc.): \_\_\_\_\_

What wildlife might you expect to see here? \_\_\_\_\_

Any animals (including birds) seen on site: \_\_\_\_\_

## Part 2. Associations between Aesthetics & Engagement with Nature and Happiness

### JOURNALING ASSIGNMENT:

Self-esteem is used to describe a person's overall sense of self-worth or personal value.

**What makes you feel like you have good self-esteem?**

**Think of a time when you felt good about yourself and describe that time.**

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Feel free to use the space below for sketching/drawing.

A large, empty rectangular box with a thin blue border, intended for students to sketch or draw their ideas.

**Part 4. Small-group discussion on associations and large-group discussion on overall theme.**

Below, write any interesting facts or new things that you learned during the discussions.

## Healthy Environment, Healthy You

Discussion Guide with List of Associations to Aesthetics & Engagement with Nature

These materials are all part of EPA Report #: EPA/600/R-18/231.

Below is a selection of published research findings on our three health topics for teachers to use after the journaling session. These findings can be used in whatever way works best for your classroom. Here are some of the ways that teachers have used them in their classrooms:

- Listed on the board for students to discuss.
- Listed on the board for students to think about and use to extend on their journaling.
- Cut out on small slips of paper so that each student receives a different one, reads it aloud, and the group discusses it.
- The class is split up into three small groups, with each group receiving a different health prompt (anxiety, happiness, or self-esteem). Then the discussions using these associations happen in small groups, where the group gets the handout and reads the associations together before all coming together as a large group to share ideas.

### **ANXIETY**

**Association with "Aesthetics and Engagement with Nature"** -- Studies suggest that viewing natural landscapes, even in photos, can decrease feelings of anxiety. Additionally, spending time in green space and exercising outdoors can significantly reduce anxiety; this effect is increased by the presence of water.

#### **- Evidence -**

[1] Both meditative and athletic walking in a forested environment reduced reported anxiety more than either of these activities in an indoor environment. In both settings, meditative walking was found to reduce anxiety more than athletic walking (Shin et al., 2013; n=139 young women, Korea).

[2] Exposure to a natural setting reduced feelings of anxiety by 1.46 points on a 5-point scale, while exposure to an urban setting reduced anxiety by .77 points on a 5-point scale (Ulrich et al., 1991).

[3] Running outdoors reduced anxiety by nearly 38% (Harte et al., 1995; n=10, Australia).

[4] Compared with scores after walking outdoors, walking indoors was associated with higher scores of anxiety (1 pt. on 6 pt. scale) for post-menopausal women (Teas et al., 2007; n=19, South Carolina).

[5] A study that focused on sick leave due to psychiatric diagnoses found that after nature-based rehabilitation, 63-71% of patients lowered their anxiety (p less than 0.0001-0.005) (Sahlin et al., 2015; n=105, Sweden).

[6] A 90-min walk in a natural setting, compared to an urban setting, decreased both self-reported rumination (p less than 0.05) and neural activity in the subgenual prefrontal cortex (associated with a self-focused behavioral withdrawal linked to rumination) (p less than 0.0001) in healthy participants (Bratman et al., 2015; n=90, San Francisco, California).

[7] Viewing pictures of urban landscapes increased anxiety slightly, while viewing pictures of nature with water present significantly decreased anxiety (Ulrich 1981; n=18, Sweden).

[8] Walking in a natural environment with a limited field of vision and with opportunities for concealment significantly increased reported levels of fear relative to pre-walk status (Gatersleben et al., 2013; n=17, southern England).

[9] Study subjects who perceived the absence of greenery and other public assets (places to walk or sit, or safe places for children to play) in their neighborhoods reported 2.5 times higher levels of anxiety and poor general health (Ellaway et al., 2009; n=1637, Scotland).

## **HAPPINESS**

**Association with "Aesthetics and Engagement with Nature"** -- Viewing photos of natural settings and/or walking outdoors are associated with higher levels of positive feelings. Those who live in greener areas have reported higher levels of happiness.

### **- Evidence -**

[1] In a study using a phone app to record happiness levels in different environments, participants reported being significantly happier outdoors in all green or natural habitat types than in urban settings (1.8 to 2.7 points happier on a 0-100 scale). Marine and coastal shorelines were the happiest locations--approximately 6 points higher than urban environment--a difference similar to attending an exhibition versus doing housework (MacKerron & Mourato 2013; n=21,947, UK).

[2] College students who spent time in a natural environment versus an urban environment or in passive relaxation reported higher overall happiness (Hartig et al., 1991; n=34, California).

[3] Both meditative and athletic walking in a forested environment increased reported happiness more than either of these activities in an indoor environment. In both settings, meditative walking was found to increase happiness more than athletic walking (Shin et al., 2013; n=139 young women, Korea).

[4] Compared with scores after walking outdoors, walking indoors was associated with lower scores for feelings of being pleased (0.8 point lower on a 6-point scale) and lower scores for feelings of delight (0.9 point lower on a 6-point scale) for post-menopausal women (Teas et al., 2007; n=19, South Carolina).

[5] Walking in a rural setting had a positive effect on mood, including stress and happiness; this effect was larger in the poor health group (Roe and Aspinall 2011; n=123, UK).

[6] Frequent group walks in green corridors or farmland versus urban areas were associated with significantly reduced scores for negative affect (emotional state) in a study of primarily older adults (55 years or older) (Marselle et al., 2013; n=708, England).

[7] Those who engaged in physical activity while immersed in natural settings had a more positive affect when compared with sedentary individuals and those physically active in a laboratory setting (p less than 0.01) (Kinnafick and Thogersen-Ntoumani, 2014; n=40, United Kingdom).

[8] Walking in a natural environment with a limited field of vision and with opportunities for concealment significantly increased reported levels of sadness relative to pre-walk status (Gatersleben et al., 2013; n=17, southern England).

[9] Also, biodiversity might be associated with happiness, as individuals that visited parks with greater plant diversity levels reported higher levels of happiness (Suarez et al., 2014; 2014; n=10, Grenada, Spain).

[10] Study participants who were shown various photos of urban or natural settings following the viewing of a stressful video reported improved positive feelings after viewing the natural settings (Ulrich 1991; n=120, Delaware).

[11] In a study comparing two neighborhoods with varying levels of green space, those in the greener neighborhood reported higher levels of satisfaction and happiness (Herzele and de Vries 2011; n=190, Belgium).

[12] As engagement with natural beauty increased by one unit, life satisfaction was predicted to increase by 15% (Zhang et al., 2014; n=Study 1: 1108, Study 2: 151; Berkeley, CA).

## **SELF-ESTEEM**

**Association with "Aesthetics and Engagement with Nature"** -- Exercising and walking outdoors, and even viewing pictures of nature, can significantly improve self-esteem.

### **- Evidence -**

[1] Both meditative and athletic walking in a forested environment increased reported self-esteem more than either of these activities in an indoor environment. In both settings, meditative walking was found to increase self-esteem more than athletic walking (Shin et al., 2013; n=139 young women, Korea).

[2] Taking a walk outdoors improved self-esteem by 25% (Peacock et al., 2007; n=20, UK).

[3] People who took part in green exercise reported a 9% improvement in self-esteem after the activity (Pretty et al., 2005; n=263, UK).

[4] In a multi-study analysis, researchers found that acute short-term exposures to green exercise improved both self-esteem (effect size=0.46) and mood (effect size=0.54). This improvement was true for all green environments and increased with the presence of water, regardless of duration or intensity of exercise (Barton and Pretty 2010; n=1252, UK).

[5] After viewing different outdoor scenes and exercising, participants experienced positive changes in self-esteem (Pretty et al., 2005; n=100, UK).

[6] Reported self-esteem was higher following exposure to a mild stress for study participants who had first viewed images of natural versus urban scenes (Brown et al., 2013; n=25, England).

[7] In two similar studies evaluating natural/green effect on adolescent self-esteem, findings showed no effect of viewing different scenes (Wood et al., 2013; n=25, UK) or exercising in different conditions (Reed et al., 2013; n=75, UK) on self-esteem. In both cases, significant main effect was found for exercise alone.