

## **Minnesota's Changing Climate Learning Outcomes and Alignment with Minnesota Science and Literacy Standards**

### **Grades 3-12**

#### **Lesson 1: What is a journal for?**

- Students will identify key features of a journal
- Students will identify journal entry themes
- Students will compare journal entries from different time periods and in different styles
- Students will create their own journal to be used for outdoor observation

#### **Online Classroom Outcomes:**

- Students will view examples of journals from historical figures in Minnesota history
- Students will submit their own journal entries about their biome or "place."
- Students will comment on journal entries made by other students.

### **Minnesota Science Standards**

3.3.2.1

5.1.1.1, 5.1.1.2.1

### **Literacy in History/Social Studies, Science, and Technical Subjects**

#### **Level 6-8**

12.1.1, 12.2.2

13.6.6

14.3.3, 14.4.4, 14.10.10

#### **Level 9-10**

13.6.6

14.2.2, 14.3.3, 14.4.4, 14.10.10

#### **Level 11-12**

13.6.6

14.2.2, 14.3.3, 14.4.4, 14.10.10

### **Grades 3-12**

#### **Lesson 2: What defines Minnesota's biomes?**

- Students will identify Minnesota's four main biomes.
- Students will identify characteristic vegetation and animals found in each biome.
- Students will observe the biome they live and record observations in their journal.
- Students will describe the factors that define each biome.

#### **In addition Grades 9-12**

- Students will describe how the land has changed from its "natural vegetation"
- Students will define what are other anthropogenic characteristics of each biome
- Students will hypothesize the impact land use change on vegetation and animals in each biome

#### **Online Classroom Outcomes:**

- Students will “explore” Minnesota’s biomes learning key characteristics, flora and fauna, etc.
- Students will submit observations in photo, video or written form of their biome.
- Students will interact with data associated with Minnesota’s biomes.
- Students will watch videos from experts and other Minnesotans about their sense of place in their Minnesota biome.

**Minnesota Science Standards**

3.1.1.2.1, 3.1.1.2.3, 3.1.1.2.4, 3.1.3.2.1, 3.1.3.2.2, 3.4.1.1.2

5.1.1.1.4, 5.1.1.2.1, 5.1.3.4.2, 5.4.1.1.1, 5.4.2.1.1

6.1.3.1.1, 6.1.3.4.2

7.1.1.2.1, 7.1.3.4.1, 7.1.3.4.2, 7.4.2.1.1, 7.4.2.1.3, 7.4.3.2.4, 7.4.4.1.2

8.1.3.4.2

9.1.3.1.1, 9.1.3.4.3, 9.4.4.1.2

**Literacy in History/Social Studies, Science, and Technical Subjects**

**Level 6-8**

14.2.2, 14.3.3, 14.4.4, 14.7.7, 14.8.8, 14.10.10

**Level 9-10**

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**Level 11-12**

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14.2.2, 14.3.3, 14.4.4, 14.6.6, 14.10.10

**Grades 3-8**

**Lesson 3: What defines Minnesota’s Climate?**

- Students will define climate, weather and phenology
- Students will define climate change.
- Students will gather their own weather data from their school site and record it in their journal.
- Students will graphically represent authentic data from Minnesota’s Climatology site.

**In addition Grades 9-12**

- Students will interpret graphs showing long-term precipitation and temperature trends in Minnesota
- Students will discuss the importance of longitudinal data
- Students will gather their own weather data from their school site and record it in their journal

**Online Classroom Outcomes:**

- Students will interact with data associated with Minnesota’s climate
- Students will submit their own weather reports
- Students will watch videos from experts and other Minnesotans about weather and climate.

**Minnesota Science Standards**

3.1.1.1.1, 3.1.1.2.3, 3.1.1.2.4, 3.1.3.2.1, 3.1.3.2.2, 3.1.3.4.1

4.2.1.1.1, 4.3.2.3.1

5.1.1.2.2, 5.1.3.4.1, 5.1.3.4.2, 5.4.2.1.2

7.1.1.2.3, 7.1.3.4.1, 7.4.2.1.3

8.1.3.3.3, 8.1.3.4.1

9.1.1.1.2, 9.1.1.2.4, 9.1.3.1.1, 9.1.3.1.2, 9.1.3.4.3

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#### **Level 9-10**

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### **Grades 3-12**

#### **Lesson 4: What is climate change and what does it mean for Minnesota?**

- Students will explain the causes of climate change
- Students will explain the implications of climate change
- Students will predict how climate change might impact or is impacting the area where they live
- Students will describe five key issues for Minnesotans facing climate change

#### **Online Classroom Outcomes**

- Students will submit journal entries with their climate change predictions
- Student will visit the online classroom section on climate change and use the interactive climate change game.

#### **Minnesota Science Standards**

3.1.1.1.1, 3.1.1.2.1, 3.1.1.2.3, 3.1.1.2.4, 3.1.3.2.1, 3.1.3.2.2

4.1.2.1.1,

5.1.1.1.1, 5.3.4.1.1, 5.4.2.1.2, 5.4.4.1.1

7.1.12.3, 7.4.3.2.4

8.1.3.3.3, 8.1.3.4.1, 8.3.2.2.1, 8.3.2.2.3

9.1.1.2.4, 9.1.3.1.3, 9.1.3.3.1, 9.1.3.4.3, 9.2.4.1.1, 9.3.4.1.2, 9.4.4.1.2,

9C.1.3.3.1, 9P.1.3.3.1

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**Grades 3-8**

**Lesson 5: What does the data show?**

- Students will make their own interpretations of authentic graphs representing different impacts of climate change in Minnesota.
- Students will make the connection between a 3-D object and what the graph represents.
- Students will divide 6 statements about the graph into True or False categories.
- Students will share their results.
- Students will brainstorm how climate change could affect their biome.

**Grades 9-12**

- Students will make their own interpretations of authentic graphs representing different impacts of climate change in Minnesota
- Students will make the connection between a 3-D object and what the graph represents
- Students will divide 6 statements about the graph into True or False categories
- Students will share their results
- Students will brainstorm how climate change could affect their biome.
- Students will develop their own True/False statements about scientific figures and exchange with another student
- Students will share their results
- Students will discuss the importance of corroborative data in support of climate change science

**Online Classroom Outcomes:**

- Students will “explore” the effects of a changing climate on Minnesota’s biomes
- Students will watch videos from experts and other Minnesotans on the effects of a changing climate on Minnesota’s biomes.
- Students will submit journal entries about how a changing climate might affect their place.

**Minnesota Science Standards**

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5.1.1.1.1, 5.3.4.1.1, 5.4.2.1.2, 5.4.4.1.1  
6.1.3.4.1  
7.1.1.2.3, 7.1.3.4.1  
8.1.1.2.1, 8.1.3.3.3, 8.1.3.4.1, 8.3.2.2.1, 8.3.2.2.3  
9.1.1.1.2, 9.1.1.2.4, 9.1.3.1.3, 9.1.3.4.3, 9.3.4.1.2, 9.4.4.1.2

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**Grades 3-12**

**Lesson 6: What can I do?**

- Students will brainstorm appropriate solutions and select one for their group, class or school.
- Students will develop a climate action plan and begin to implement it.

**Online Classroom Outcomes:**

- Students will submit their climate actions plans.
- Students will share photo and video of their climate action projects.
- Students will watch videos of experts doing research in mitigation/adaptation.

**Minnesota Science Standards**

3.1.1.1.1, 3.1.1.2.1, 3.1.1.2.4, 3.1.3.2.1, 3.1.3.2.2

4.1.2.1.1

5.3.4.1.3, 5.4.4.1.1

7.4.4.1.2

8.3.4.1.2

9.1.1.1.2, 9.1.1.2.2, 9.1.1.2.3, 9.1.3.1.1, 9.1.3.1.3, 9.1.3.3.2, 9.1.3.4.3, 9.3.4.1.2,

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14.1.1, 14.2.2, 14.3.3, 14.4.4, 14.6.6, 14.7.7, 14.8.8, 14.9.9, 14.10, 14.10