

**OKEMOS PUBLIC SCHOOLS  
NEW COURSE PROPOSAL**

1. Course Title: Meteorology
2. Course Developer(s): Alexandria Williams
3. Have the following reviewed this proposal?
  - a. Area Coordinator
  - b. District-Wide Coordinator
  - c. Appropriate Building Representatives
  - d. Principal
4. School where this course will be implemented: Okemos High School
  - a. Course Implementation Starting Date: August 2023
5. Regular Program or Pilot: Regular - Semester long course not full year
6. Required Course/Elective Course: Physical Science or General Physical Science
7. Evidence of need or interest: Science elective with low stress
8. How does this fit into the core curriculum: Allowing students to better understand the world around them.
9. Number of students benefited/Impacted: 2 classes of students (1 class per semester)
10. Credit to be granted:  Yes  No
11. Instructional materials to be recommended:
  - a. Basic Text: No text needed
  - b. Supplementary:
  - c. None recommended:
  - d. Author:
  - e. Title:
  - f. Publisher of Materials:
12. Hands on Materials: Science department has a lot of the materials and will use Gizmos and other online resources.
13. Supplies other than textbooks:
14. Estimated Costs: \$0
15. Goals (content of course; sequence of course in curriculum): The goal of this course is to offer students a one semester science elective course on basic meteorology. Specifically, the students will gain a better understanding of local, national and world weather patterns they are affected by in their everyday lives throughout the study of basic weather elements and surface weather systems. \*\* Please see attached PDF for units and learning objectives.

Principal Signature

Date

**PROPOSAL SHOULD BE SUBMITTED TO STACY BAILEY, ASST. SUPERINTENDENT FOR INSTRUCTION**

Meteorology New Course Proposal  
Alexandria Williams

**Goals:** The goal of this course is to offer students a one semester science elective course on basic meteorology. Specifically, the students will gain a better understanding of local, national and world weather patterns they are affected by in their everyday lives throughout the study of basic weather elements and surface weather systems.

**Unit 1 - Earth's Dynamic Atmosphere**

- **Learning Objectives:** Students should be able to:
  - Distinguish between weather and climate and name the basic elements of weather and climate.
  - List the major gasses composing Earth's atmosphere and identify the components that are most important to understanding weather and climate.
  - Interpret a graph that shows changes in air pressure from Earth's surface to the top of the atmosphere.
  - Sketch and label a graph that shows atmospheric layers based on temperature.
  - Explain what causes the Sun angle and length of daylight to change during the year and describe how these changes produce the seasons.
  - Discuss the principal controls of temperature and use examples to describe their effects.

**Unit 2 - Moisture, Clouds and Precipitation**

- **Learning Objectives:** Students should be able to:
  - List and describe the processes that cause water to change from one state of matter to another.
  - Distinguish between relative humidity and dew point.
  - List and describe the four mechanisms that cause air to rise.
  - List the necessary conditions for condensation and briefly describe the two criteria used for cloud classification.
  - Describe the two mechanisms that produce precipitation.
  - List the different types of precipitation and explain how each type forms.
  - Explain how precipitation is measured.

**Unit 3 - Air Pressure and Wind**

- **Learning Objectives:** Students should be able to:
  - Discuss the three forces that act on the atmosphere to either create or alter winds.
  - Contrast the weather associated with low-pressure centers and high-pressure centers.
  - List three types of local winds and describe their formation.
  - Discuss the major factors that influence the global distribution of precipitation.
  - Summarize Earth's idealized global circulation. Describing how continents and seasonal temperatures change complicate the idealized pattern.

**Unit 4 - Weather Patterns and Severe Storms**

- **Learning Objectives:** Students should be able to:
  - Discuss air masses, their classification and associated weather.
  - Compare and contrast typical weather associated with a warm front and a cold front.
  - List the basic requirements for thunderstorm formation and locate places on a map that exhibit frequent thunderstorm activity.
  - Identify areas of hurricane formation on a world map and discuss the conditions that promote hurricane formations.

# OKEMOS PUBLIC SCHOOLS

## NEW COURSE PROPOSAL

1. Course Title: L.I.F.E. - Logic, Investing, Financial Literacy, and Engineering
2. Course Developer(s): William Harnica/OHS Mathematics Department
3. Have the following reviewed this proposal?
  - a. Area Coordinator
  - b. District-Wide Coordinator
  - c. Appropriate Building Representatives
  - d. Principal
4. School where this course will be implemented: Okemos High School
  - a. Course Implementation Starting Date: Fall 2023
5. Regular Program or Pilot: Pilot
6. Required Course/Elective Course: Elective Course
7. Evidence of need or interest: The common question across our mathematics department from students is "When will I ever use this?" Though we can always promote mathematics due to the skills developed while learning the content, such as collaboration, critical thinking, perseverance, etc., the truth is that for most students, the content itself is not practical. This course is designed to address this issue and give the students exposure to content that they will come across in their own lives, all while viewing these topics through a mathematical lens. Students have a natural curiosity when it comes to learning topics that they value or find challenging, as long as an intrinsic motivation is in effect. Lastly, as I have grown my relationships with students over the years, anecdotally they have been excited for my logic problem warm-ups and conversations about my personal experiences with investing and doing research for the Department of Engineering at Michigan State University. Students are intrigued and want to learn about these topics; this course could help promote student success outside of the classroom and after their high school education concludes.
8. How does this fit into the core curriculum: This would be a semester math elective offered to juniors and seniors.
9. Number of students benefited/impacted: Approximately 30 students per semester for each section.
10. Credit to be granted:  Yes  No
11. Instructional materials to be recommended:
  - a. Basic Text: Literature on Investing #1 - Rich Dad Poor Dad: What the Rich Teach Their Kids About Money That the Poor and Middle Class Do Not!
  - b. Supplementary: Literature on Investing #2 - The Intelligent Investor: The Definitive Book on Value Investing
  - c. None recommended: N/a
  - d. Author: Robert Kiyosaki; Benjamin Graham
  - e. Title: Rich Dad Poor Dad: What the Rich Teach Their Kids About Money That the Poor and Middle Class Do Not!; The Intelligent Investor: The Definitive Book on Value Investing
  - f. Publisher of Materials: Warner Books; Harper & Row Publishers Inc.
12. Hands on Materials: Materials for engineering concepts/tasks

**PROPOSAL SHOULD BE SUBMITTED TO STACY BAILEY, ASST. SUPERINTENDENT FOR INSTRUCTION**

13. Supplies other than textbooks: Online materials/programs/software
14. Estimated Costs: One section per semester: \$1500 for textbooks and materials
15. Goals (content of course; sequence of course in curriculum): Use mathematics to explore tangible concepts for students with a goal of promoting critical thinking and increasing students' financial literacy. The topics of logic problems, investing, financial literacy, and engineering would be woven together throughout the semester.

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Principal Signature

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Date

# OKEMOS PUBLIC SCHOOLS

## NEW COURSE PROPOSAL

1. Course Title: **AP Environmental Science**
2. Course Developer(s): **Laura Bell**
3. Have the following reviewed this proposal?
  - a. Area Coordinator **X**
  - b. District-Wide Coordinator
  - c. Appropriate Building Representatives
  - d. Principal
4. School where this course will be implemented: **Okemos High School**
  - a. Course Implementation Starting Date: **2024/25 school year**
5. Regular Program or Pilot: **Regular Program**
6. Required Course/Elective Course: **Elective**
7. Evidence of need or interest:

**Many Okemos High School students have a strong academic interest in AP-level courses and OHS students on average take more science coursework than required for graduation. There is student interest in a diversity of science courses especially in light of the change to graduation requirements allowing for more student choice in their science curriculum. Students and parents have asked me if there will be an AP version of environmental science, and a few students have taken an AP environmental science course online since it is not offered at Okemos High School but would have preferred an in-person course at OHS.**

**OHS students have an interest in environmental issues both locally and globally, as evidenced by the existence and activities of the student-directed Earth Club (Students for Environmental Action) as well as student engagement in the Environmental Science and Wildlife Biology course (non-AP). I had originally hoped that I could supplement the already-offered Environmental Science & Wildlife Biology course to allow for an AP option, but now that I have been teaching it I have realized it is not realistic. The Honors Physics course at OHS allows for an AP option largely because the content is already very similar to that of an AP physics curriculum so minimal supplementation is needed, and it also has more restrictive enrollment requirements. The Environmental Science & Wildlife Biology class is open to a wide range of learners and also has a wider range of content because it allocates about half of course time to environmental science but the other half to wildlife biology. The wildlife units focus largely on content that is not addressed on an AP Environmental Science test, and the environmental science work done in that class incorporates a lot of fieldwork and projects, reducing the amount of time available to cover the great number of topics that appear on the AP test. As a result, there is far too much content that would need to be part of an AP course that does not fit into the Environmental Science & Wildlife Biology class than is reasonable to have students self-study or supplement. This has made it so an AP option has not been feasible and thus an AP course is being proposed instead.**

**The AP course would not replace the already-offered course Environmental Science & Wildlife Biology. That course is important to continue to offer so that students who do not want the**

stress or rigor of an AP course have access to an environmentally-focused learning option and due to student interest in the fieldwork and wildlife content that are incorporated into the non-AP class. Instead, both courses would continue to be run but in alternate years. This would allow students to take either one or both.

The AP environmental science class would also give students an AP science option for those students who do not plan to take a full-year chemistry class, making it more accessible to a wider range of students than the current science department AP offerings. Currently, both AP biology and AP chemistry require students to take 3 science courses before the AP class (PES, biology, chemistry). The prerequisite courses for the AP environmental science class would be the required 9th and 10th grade OHS classes (physical science and biology), so students could then take either the non-AP environmental and wildlife class or the AP environmental science course or both after they've completed their 2 required science courses without needing additional science pre-reqs.

In conclusion, the addition of an AP environmental science class will attract a wider range of students to take a course that addresses environmental concerns and consequently also helps support the district's strategic plan, which seeks to increase environmental awareness and responsible action among our students.

8. How does this fit into the core curriculum:

This course would incorporate aspects of biology, physical science, and earth science, which would support student learning and applications of concepts from these required / core courses and help prepare students for state testing. This course can also be used to fulfill the graduation requirement of 1 science elective after physical science and biology. Additionally, students will be prepared to take the AP Environmental Science test offered each spring to potentially earn college credit.

9. Number of students benefited/impacted:

The number would depend upon the number of students who enroll in the course. Estimated at 1-2 sections (25 - 50 students) during academic years when it is offered.

10. Credit to be granted:  Yes  No

11. Instructional materials to be recommended:

a. Text:

b. Supplementary:

c. None recommended:

d. Author: **Withgott and Laposata**

e. Title: **Environment: The Science Behind the Stories, AP Edition (The school already has 1 class set)**

f. Publisher of Materials: **Pearson**

12. Hands on Materials: **Lab materials and standard classroom supplies**

13. Supplies other than textbooks: **Lab materials and standard classroom supplies**

14. Estimated Costs: **~\$600-800 to purchase materials to support new lab activities**

15. Goals (content of course; sequence of course in curriculum):

Unit 1: The Living World: Ecosystems

- Introduction to ecosystems
- Terrestrial and aquatic biomes
- Primary productivity
- Carbon, nitrogen, phosphorus, and water cycles
- Trophic levels
- The flow of energy in an ecosystem and the 10% rule
- Food chains and food webs

Unit 2: The Living World: Biodiversity

- Introduction to biodiversity
- Ecosystem services
- Island biogeography
- Ecological tolerance
- Natural disruptions to ecosystems
- Ecological succession

Unit 3: Population

- Generalist and specialist species
- Survivorship curves
- Population growth and resource availability
- Age structure diagrams
- Human population dynamics

Unit 4: Earth Systems & Resources

- Tectonic plates
- Soil formation and erosion
- Earth's atmosphere
- Global wind patterns
- Earth's geography and climate
- El Niño and La Niña

Unit 5: Land and Water Use

- The tragedy of the commons
- The Green Revolution
- Types and effects of irrigation
- Pest-control methods
- Meat production methods and overfishing
- The impacts of mining
- Urbanization and ecological footprints
- Introduction to sustainable practices including crop rotation and aquaculture

**Unit 6: Energy Resources and Consumption**

- Energy sources and fuel types, including fossil fuels, ethanol, and nuclear power
- Global energy consumption and distribution of natural resources
- Natural sources of energy, including solar power, wind, geothermal, and hydroelectric power
- Energy conservation methods

**Unit 7: Atmospheric Pollution**

- Introduction to air pollution
- Photochemical smog
- Indoor air pollution
- Methods to reduce air pollutants
- Acid rain
- Noise pollution

**Unit 8: Aquatic and Terrestrial Pollution**

- Sources of pollution
- Human Impact on ecosystems
- Thermal pollution
- Solid waste disposal and waste reduction methods
- Pollution and human health
- Pathogens and Infectious diseases

**Unit 9: Global Change**

- Ozone depletion
- Global climate change
- Ocean warming and acidification
- Invasive species
- Human impacts on diversity

  
Principal Signature

10/21/22  
Date