Teacher Preparation Lesson Plan: Calculating Bearings

Subject Area: Mathematics
Unit Title: Navigation and Surveying
Grade Level: 11-12
Lesson Number: 1 of 10

Duration: 60 minutes
Date: March 10, 2023
Teacher: John Doe
Room: 101

Introduction to Bearings

Calculating bearings is a fundamental concept in navigation, surveying, and geography. It is a crucial skill that requires attention to detail, precision, and practice. In this lesson, we will introduce the concept of bearings, their importance in navigation, and how to calculate them using visual aids and real-world examples.

Types of Bearings

There are three main types of bearings: true bearings, magnetic bearings, and grid bearings. True bearings are measured from the direction of true north, while magnetic bearings are measured from the direction of magnetic north. Grid bearings are measured from the direction of the grid lines on a map.

- True Bearings: measured from true north
- Magnetic Bearings: measured from magnetic north
- Grid Bearings: measured from grid lines on a map

Importance of Bearings

Bearings are used in real-world scenarios, such as in aviation, maritime, and outdoor activities. They are used to navigate, survey, and map areas, and to solve problems and make informed decisions.

Calculating Bearings

To calculate a bearing, you need to know the direction of the location or object, and the angle between the direction and the reference direction. You can use a compass, protractor, or trigonometry to calculate the bearing.

1. Identify the direction of the location or object
2. Measure the angle between the direction and the reference direction
3. Calculate the bearing using a compass or protractor

Practice Exercise

Work in pairs to calculate the bearing of a location using a compass and map. Use the following steps:

1. Identify the direction of the location or object
2. Measure the angle between the direction and the reference direction
3. Calculate the bearing using a compass or protractor

Real-World Applications

Bearings are used in real-world scenarios, such as in aviation, maritime, and outdoor activities. They are used to navigate, survey, and map areas, and to solve problems and make informed decisions.

- Aviation: used for navigation and orientation
- Maritime: used for navigation and charting courses
- Outdoor Activities: used for hiking, camping, and orienteering

Case Study

A hiker is lost in the woods and needs to find their way back to camp. They use a compass and map to calculate their bearing and navigate back to camp.

Guided Practice

Work in pairs to calculate the bearing of a location using a compass and map. Use the following steps:

1. Identify the direction of the location or object
2. Measure the angle between the direction and the reference direction
3. Calculate the bearing using a compass or protractor

Teacher Guidance

Circulate around the room to provide guidance and support as needed. Encourage students to ask questions and seek clarification on any concepts they do not understand.

Independent Practice

Work individually to calculate the bearing of a location using different methods. Use visual aids and examples to support your calculations.

Assessment

Formative assessment will be ongoing throughout the lesson, with quizzes, class discussions, and observations used to monitor student progress and understanding. Summative assessment will be used to evaluate student understanding at the end of the lesson, with a written test, practical exercise, and project used to assess student knowledge and skills.

Conclusion

Calculating bearings is a crucial skill that requires attention to detail, precision, and practice. By understanding the different types of bearings and how to calculate them, students can apply their knowledge in real-world scenarios, such as navigation, surveying, and geography.

Reflection

What did you learn about calculating bearings in this lesson? What challenges did you face, and how did you overcome them? What would you like to learn more about in future lessons?