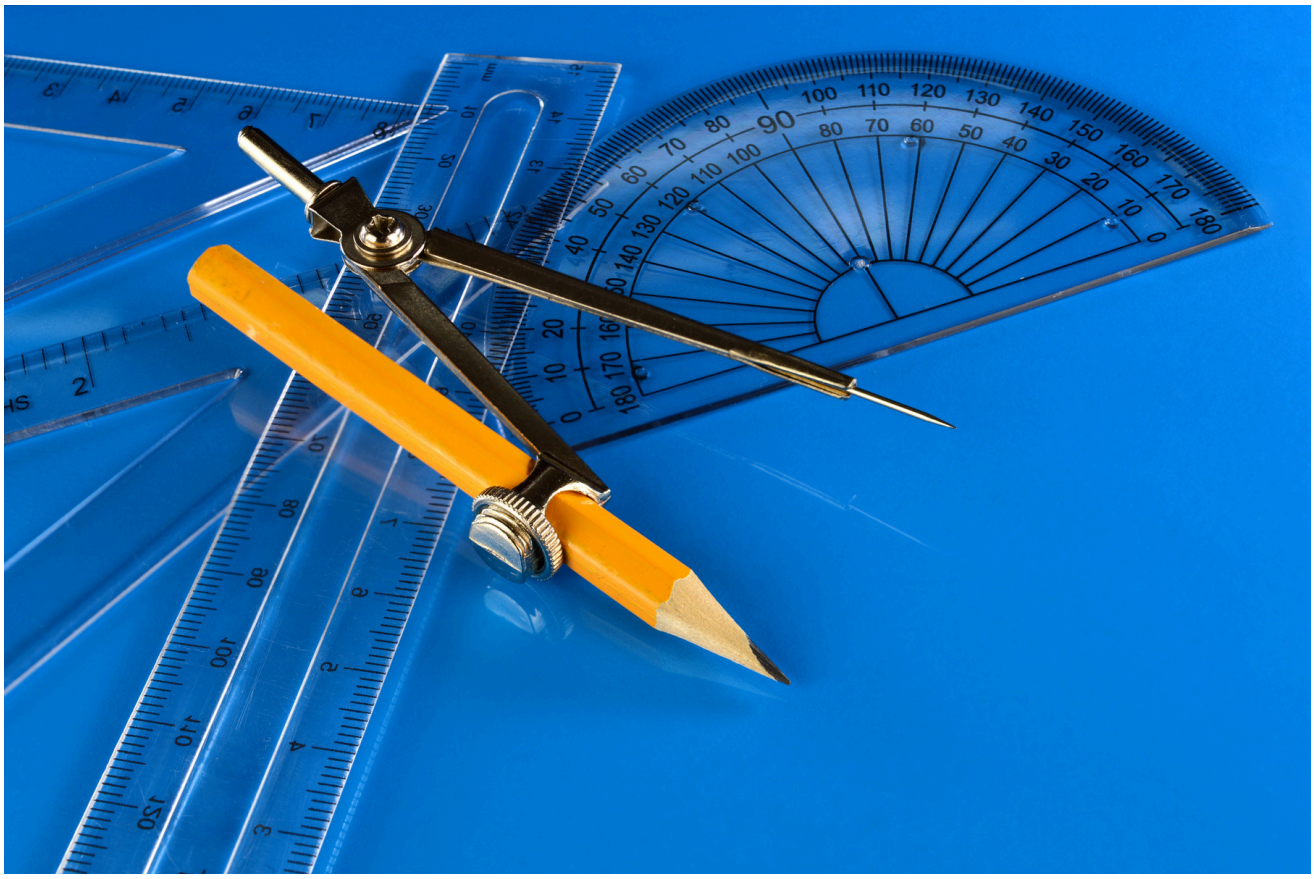
Compasses and Protractors



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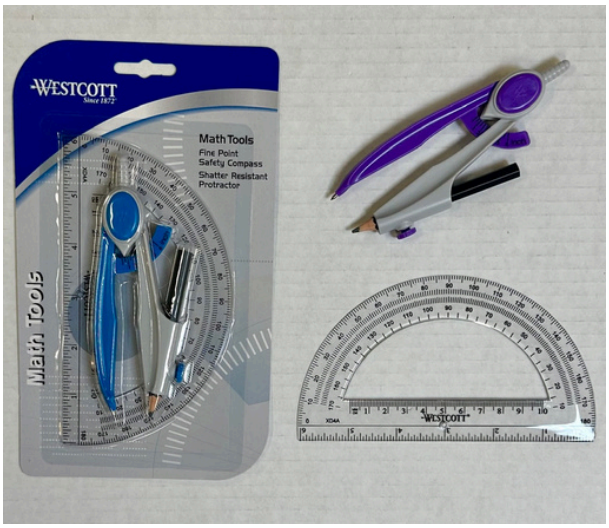

The Compasses and Protractors STEAM Kit provides essential tools for students to explore geometry, measurement, and angles. With 30 compasses and 30 protractors, this kit encourages hands-on learning in both individual and group settings. Students can practice drawing precise circles, measuring angles, and understanding the fundamental concepts of geometry through interactive exercises and design challenges. Ideal for introducing key mathematical concepts, this kit fosters spatial reasoning, critical thinking, and precision.

Grade Level

3rd - 12th

Group Size

1 - 2 students per set

Time Duration

15 - 45 minutes

Content of Kits

Components

- 30 Compasses
- 30 Protractors

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Usage

Getting Started

1. **Introduce the Tools -** Show students how to use both the compass and protractor. Explain the purpose of each tool and how they relate to measuring angles and drawing circles.
2. **Demonstrate Basic Techniques -** Model how to set the compass to draw a circle and use the protractor to measure angles. Demonstrate how to align the protractor with a line to accurately measure the degree of an angle.
3. **Hands-on Exploration -** Allow students to experiment with the tools by creating their own designs. Encourage them to draw circles, measure angles, and explore geometric shapes.
4. **Safety Briefing -** Remind students to handle the compasses carefully to avoid poking or injury with the sharp point. Ensure they use the protractor to measure accurately without bending or damaging it.

Storage

- Store compasses and protractors in separate, labeled compartments or containers to keep them organized and prevent damage.
- Keep the kit in a dry area to prevent rust or damage to the metal parts of the compasses.

Troubleshooting

- **Compasses not drawing accurately -** Ensure the pencil or lead is securely placed in the compass and that the compass is properly set to the desired radius. If the compass is too loose, tighten the arm slightly.
- **Protractors not aligning properly with lines -** Ensure that students are aligning the baseline of the protractor correctly with the edge of the shape or angle. Demonstrate how to place the midpoint of the protractor at the vertex of the angle.
- **Compasses or protractors bending or breaking -** Handle tools gently and remind students to avoid excessive pressure on the compass arms. Replace damaged tools as needed.

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Activity Guide

Beginner

Circle Maker
Students will use the compass to draw circles of different sizes. They can practice adjusting the radius and experiment with creating overlapping circles. Encourage them to explore the concept of concentric circles (circles within circles).

Intermediate

Angle Measuring
Students will use the protractor to measure angles of various shapes (e.g., triangles, squares) and label each angle. Ask students to classify angles as acute, obtuse, or right angles. This will help them become familiar with the different types of angles and how to measure them accurately.

Advanced

Geometric Design Challenge
Students will create a geometric design (such as a star, flower, or polygon) using both the compass and protractor. Encourage them to incorporate a variety of angles and circle-based designs. Afterward, they will present their design and explain the geometric principles behind it.

Extension Activities:

Angles in the Real World
Students will go on an “angle hunt” around the classroom or outdoors, identifying and measuring angles in everyday objects (e.g., corners of books, desks, building structures). They will then report their findings, explaining how the angles they measured relate to the shapes and designs around them.

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Learning Extensions

STEAM Connections: Math - Engineering - Design

Learning Objectives:

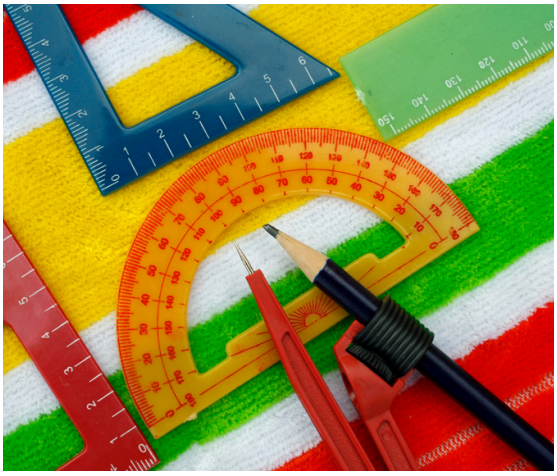
- Learn to use compasses and protractors to measure angles and draw accurate circles.
- Understand the concepts of geometric shapes, angles, and circles.
- Practice using precision tools to create and design geometric patterns.
- Develop spatial reasoning and visualization skills through design and measurement activities.
- Foster critical thinking and problem-solving through geometric exploration.

Career Connections:

- **Engineer -** Uses geometry, angles, and precise measurement tools in design and construction.
- **Architect -** Designs structures using geometric principles and precise measurements of angles and shapes.
- **Surveyor -** Measures land and maps angles and distances for construction and real estate purposes.
- **Mathematician -** Studies geometric properties, angles, and the mathematical relationships between shapes.

Essential Employability Skills:

- Critical Thinking
- Attention to Detail
- Collaboration
- Communication
- Problem-Solving



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Resources and Accessibility

Safety Guidelines

- Always handle the compass with care, as the needle can be sharp.
- Store tools properly to ensure their longevity and proper functioning.
- Supervise students during activities to prevent accidental injury or tool misuse.

Accessibility

- Provide tactile compasses and protractors for students with visual impairments to enhance their ability to feel and use the tools.
- Offer verbal instructions or demonstration videos for students who benefit from auditory or visual learning styles.
- Allow students with fine motor challenges to collaborate with a partner or use larger tools for better grip.

Library Catalog

Library Resources

Feedback

QR to feedback survey