Career Academy Teacher Externship Program

Understanding Tolerance Interval Lesson Plan

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Overview:

Students will be able to determine tolerance intervals and whether dimensions fall within those limits.

Featured Externship Business:

KS Kolbenschmidt

Subject:

Mathematics

Grade Level(s):

7th and 8th

Learning objectives:

After doing this activity, students should be able to:

- determine a tolerance interval and if given measurements, determine if they fall within the stated acceptable tolerance range.

Workplace Readiness Skill:

X Social Skills	X Communication
X Teamwork	X Critical Thinking
X Attitude and Initiative	X Planning and Organization
X Professionalism	▫Media Etiquette

Type of Activity:

X Individual
X Small Group
X Whole class

Model Academic Standards for School Counseling:

Academic Development Domain:

Content Standard C: Students will understand the relationship of academics to the world of work, and to life at home and in the community.

Core Performance Standard 1: Understand how to relate school to life experiences.

Career Development Domain:

Content Standard H: Students will understand the relationship between educational achievement and career development.

Core Performance Standard 2: Participate in ongoing, lifelong learning experiences to adapt to and excel in a diverse and changing economy.

Common Core State Mathematics Standards:

B.8.2 Perform and explain operations on rational numbers

7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract Rational numbers

Time:

20-30 MINUTES

Materials:

- SmartNotebook
- Notes on Tolerance Intervals (attached)
- Paper
- Writing Utensil

Directions:

1. Introduce the idea of tolerance intervals using the SmartNotebook notes (attached). Make sure students understand what the ± symbol means.

2. Work with students to determine the permissible limits of variation in the four example problems (Slide 2).

3. Have students complete the group activity from the notes (Slide 3).

4. Have students check each other's work through the extension activity (Slide 4).

Wrap-up:

Have students answer the questions on Slide 5.

1

When machining parts, certain specifications must be met. The acceptable range of measurements is called the **TOLERANCE**.

Tolerance is the permissible limits of variation. The range is given using the symbol ±.

2

Example: Find permissible limits of variation...Tolerance Interval for each problem

A. 7 cm ± 0.5 cm

B. 4 mm ± 0.02 mm

C. 0.04 mm ± .003 mm

D. 0.3 cm ± 0.01 cm

3

Activity: Send someone from your table to pop a balloon. Everyone at your table needs to write down the Tolerance Interval for your problem. Each student needs to generate a list of 5 numbers that fall within the Tolerance Interval.

0.7cm ± 0.4cm

6.2cm ± 0.04cm

1.2cm ± 0.41cm

5.1cm ± 0.83cm

6.1cm ± 0.9cm

3.2cm ± 0.009cm

0.25cm ± 0.004cm

7.5cm ± 0.02cm

Activity Extension: Exchange your paper with someone from a different table. Check their work.

1. Did they write the tolerance interval correctly?

2. Did they make a list of 5 numbers that fall within that interval?

3. Did they label their answers?

If you find any errors, respectfully discuss them with the other student. Together, make all corrections in a different color.

Wrap UP: On the back of your paper, write a complete sentence to answer each question.

1. What is a tolerance interval?
2. How it is determined?
3. What does the symbol ± mean?
4. Why might companies be concerned about checking tolerance intervals?