	Lesson Structure	*Standard:*	*Classroom Instruction that Works* Chapter	**Lesson**
A	**Access Prior Knowledge** 1-3 minutes	*Accessing prior knowledge allows students the neural courtesy to reach into their own memories for information in order to prepare to connect to new ideas and procedures.* **What will you do to get the students to think ahead of time about your lesson subject? Video, short book, brainstorming, etc.**	(6) Nonlinguistic Representations (7) Cooperative Learning (10) Cues, Questions and Advance Organizers	Have students watch the following XGames video. XGame Skateboarding Video Ask students: 1. Do you see any math in this video?
G	**Goal** Curriculum Standards Benchmarks Objectives 1-3 minutes	*Stated at the beginning of a lesson and unit, clear targets let students know the direction of the learning and they can begin to track their own progress. Feedback toward this goal helps the student to understand learned progress throughout the instruction.* **What should students KNOW and BE ABLE TO DO at the end of the lesson? How will you determine that they KNOW and are ABLE TO DO?**	(8) Setting)Objectives and Providing Feedback (4) Reinforcing effort and Providing Recognition	I can describe and explain my turn with others using mathematical language. **Standards met: MD.5 & 7, G.1** **Standards scored: OA.3, NBT. 4 & 5**
N	**New Information** Minutes dependent on the time allotted for lesson	*Presentation of new information (declarative and procedural) through reading, lectures, video, or discussion with strategies that help the learner gather and organize the information such as note taking, graphic organizers, questioning, and practice.* **New information you are teaching – text, vocabulary, concept,**	(3) Summarizing and Note Taking (5) Homework and Practice (11) Teaching Specific Types of Knowledge	Turn, Turn, Turn activity *This lesson is adapted from a Rich Lehrer lesson* 1. Students should model the different angle measurements *(see list of angles at the end of the lesson plan)* given by the teacher. After each angle measurement students should discuss: "How did you think about that turn?" 2. Teacher should write on the board what is said after each turn *(see teacher's notes for possible examples).* Students' understanding of angles will build as the
A	**Application** Minutes dependent on the time allotted for lesson	*Students use thinking skills with declarative knowledge to construct new ideas and practice to automaticity and strategic use for procedural knowledge.* **Applying learned knowledge in a new way.**	(2) Identifying Similarities and Differences (9) Generating and Testing Hypotheses (10) Cues, Questions and Advance Organizers	

				different angles are given and discussed. **Vocabulary taught: angle and degrees**
G	**Generalize** 1-3 minutes	*Generalizing completes the cycle of the lesson bringing the learner back to the goal. Using strategies such as nonlinguistic representations, generating questions or self-evaluating allows students to put "the tab on the folder" in order to retain information for longer periods of time.* **Go back to the goal – did we achieve the goal? Did you understand what we were doing? How do I (the teacher) know?**	(8) Setting)Objectives and Providing Feedback (4) Reinforcing effort and Providing Recognition	Restate the goal and score for effort and understanding.

Teacher's Notes:

Angle turns to ask students to show:

360°
180°
90°
270°
45°
120°
60°
10°

How did you think about that turn? (possible examples)

360° * A degree is 1/360th of a whole turn.

180° * $\frac{1}{2}$ of 360° or 90° + 90° or 2 x 90°

90° * $\frac{1}{2}$ of 180° or $\frac{1}{4}$ of 360° or 2 x 45° or 45° + 45°

270° * 90° + 90° + 90° or 360° - 90° or 180° + 90°
(They might see this as a multiple of 90°)

45° * $\frac{1}{2}$ of 90° or $\frac{1}{4}$ of 180° or $\frac{1}{8}$ of 360°

120° *90° + 30° or 90° + ($\frac{1}{3}$ of 90°)

60° * 30° + 30°

10° * $\frac{1}{3}$ of 30°

Ask your students: "Where is the angle?" Students will typically say that the angle is the distance on the outside of the circle not the inside.

Teacher Background knowledge:

Rich Lehr adapted from the Integrating distance and angle measure

Angle
An angle is a directed rotation from a heading.

Angle Measure
An angle can be measured as a part of a rotation. One complete rotation or 1 whole turn is the standard. Parts of turns are represented as fractions of a whole turn, as in $\frac{1}{2}$ whole-turn or $\frac{1}{3}$ whole-turn. A degree is $1/360^{th}$ of a whole turn, so 1 whole turn is 360 degrees.

Angles can also be measured as ratios of lengths, as follows. In the diagram below, a $\frac{1}{8}$ whole turn to the right is represented by the arc of the circle. This is a 45 degree clockwise rotation. The ratio of the length of the arc to the circumference of the circle × 360 degrees is 45 degrees. Try it for other degree measures with your own circles.