

**TSOKOS READING ACTIVITY**

**Option B-1B**

1. Essential Idea: The basic laws of mechanics have an extension when equivalent principles are applied to rotation. Actual objects have dimensions and they require the expansion of the point particle model to consider the possibility of different points on an object having different states of motion and/or different velocities.
2. Nature Of Science: Modelling: The use of models has different purposes and has allowed scientists to identify, simplify and analyse a problem within a given context to tackle it successfully. The extension of the point particle model to actually consider the dimensions of an object led to many groundbreaking developments in engineering.
3. Theory Of Knowledge:
  - a. Models are always valid within a context and they are modified, expanded or replaced when that context is altered or considered differently.
  - b. Are there examples of unchanging models in the natural sciences or in any other areas of knowledge?
4. Understandings:
  - a. Torque
  - b. Moment of inertia
  - c. Rotational and translational equilibrium
  - d. Angular acceleration
  - e. Equations of rotational motion for uniform angular acceleration
  - f. Newton's second law applied to angular motion
  - g. Conservation of angular momentum
5. Applications And Skills:
  - a. Calculating torque for single forces and couples
  - b. Solving problems involving moment of inertia, torque and angular acceleration
  - c. Solving problems in which objects are in both rotational and translational equilibrium
  - d. Solving problems using rotational quantities analogous to linear quantities
  - e. Sketching and interpreting graphs of rotational motion
  - f. Solving problems involving rolling without slipping
6. Guidance:
  - a. Analysis will be limited to basic geometric shapes
  - b. The equation for the moment of inertia of a specific shape will be provided when necessary

- c. Graphs will be limited to angular displacement–time, angular velocity–time and torque–time
7. Data Booklet Reference:
- $\Gamma = Fr \sin \theta$
  - $I = mr^2$
  - $\Gamma = I\alpha$
  - $\omega = 2\pi f$
  - $\omega_f = \omega_i + \alpha t$
  - $\omega_f^2 = \omega_i^2 + 2\alpha\theta$
  - $\theta = \omega_i t + \frac{1}{2}\alpha t^2$
  - $L = I\omega$
  - $E_{Krot} = \frac{1}{2}I\omega^2$
8. Utilization: Structural design and civil engineering rely on the knowledge of how objects can move in all situations
9. Aims: Aim 7: technology has allowed for computer simulations that accurately model the complicated outcomes of actions on bodies
10. Read Option B-1B in your textbook, pages 8-15.
11. Use the Cornell Notes system to take notes on the lesson material. You have the following options:
- You can print multiple copies of one of the forms on the following pages of this document and handwrite your notes.
  - You can use the MS Word form supplied below and type your notes.
    - You can then print your work and submit a hardcopy, or
    - You can upload the assignment to ManageBac. If you choose this option, you must use a filename in the format, “LastnameFirstinitialPerXAsgmtName”. For example, “SmithKPerC34ReadActT9-3.doc”
  - You can take notes on notebook paper using the Cornell Notes format and submit the hardcopy.
12. When using this form, remember the **Five R’s of Notetaking**:
- Record** – the most important or emphasized information
  - Reduce** – and synthesize information wherever possible, making it as concise as you can
  - Recite** – read your notes out loud
  - Reflect** – and consider how this information is connected to your personal experiences and what you already know
  - Review** – look over your notes more than once
13. As a minimum, you must include notes on the following topics:
- Rolling without slipping
  - Kinetic energy of a body that rolls without slipping
  - Newton’s second law applied to rotational motion

- d. Work and power in rotational motion
  - e. Angular momentum
  - f. Conservation of angular momentum
  - g. ***Remember to include a summary at the bottom!!!***
14. Answers may be typed or neatly printed. You do not need to include this page of instructions with your assignment.
15. ***Note: The following computer skills should be practiced:***
- a. *Use Microsoft Equation to type any equations.*
  - b. *Drawings may be freehand, but try to make use of the ‘Shapes’, ‘Insert Picture’ or ‘Insert Clipart’ functions of MS Word.*
  - c. *A reading assignment may contain drawings that would be useful in your notes. If you have scanning capability, you should practice scanning pictures and inserting them into documents. As you prepare for college, you should consider investing in a desktop printer-scanner-copier.*
  - d. *Just remember that for formal reports you have to cite any images that you insert into your document. You don’t have to cite scanned images for this exercise unless you use a source other than the textbook.*

**CORNELL NOTES** and the 5 R's

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**Reduce** – and synthesize information wherever possible, making it as concise as you can

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Name:

Date:

Topic:

Questions/Key Points	Notes
<b>SUMMARY:</b>	

Name \_\_\_\_\_

Date \_\_\_\_\_

# CORNELL NOTES

**Topic** \_\_\_\_\_

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<p>Questions/key points</p>	<p>Notes</p>
<p>Summary</p>	