Curriculum: West Shore SD 2009 Curriculum
Course: Physics

WEST SHORE SD
Date: May 21, 2009 ET

Topic: Conservation of Energy and Momentum
Subject Area(s):

Days: 20
Grade(s):

Key Learning: **All motion can be explained using the laws of the conservation of energy, the conservation of momentum, and/or the conservation of angular momentum.**

Unit Essential Question(s): **How does an object's mass distribution and interactions with other objects and force at a distance influence the object's motion?**

Concept: **a) momentum, energy** S11.C.3.1.1, S8.A.2.1.2, S11.A.3.3.1, S11.A.3.3.3, 3.4.12.C	Concept: **b) rot KE analogue of trans KE** S8.A.2.1.2, S11.A.3.3.1, 3.4.12.C	Concept: **c,d) conservation of energy** S11.A.1.3.1, S8.A.2.1.2, S8.A.2.1.4, S11.A.3.3.1, S11.A.3.3.3, S11.A.1.1.1, S11.A.1.1.4, S11.C.3.1.2, S8.A.2.1.1, 3.1.12.C, 3.4.12.C
Lesson Essential Question(s): How can the velocity of an object be quantified in terms of its kinetic energy? (A) How can the position of an object be quantified in terms of its potential energy? (A) How can the velocity of an object be quantified in terms of its momentum (A) How can the velocity of an object be quantified in terms of its angular momentum? (A)	**Lesson Essential Question(s):** How are rotational and translational kinetic energy related? (A)	**Lesson Essential Question(s):** How does the transformation of energy affect the total energy of a closed system? (A)
Vocabulary: potential energy, kinetic energy, momentum, angular momentum	**Vocabulary:**	**Vocabulary:** transformation, closed system

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Concept: **f) conservation of momentum** S11.C.3.1.1, S11.A.1.3.1, S8.A.2.1.2, S8.A.2.1.4, S11.A.3.3.1, S11.A.3.3.3, S11.A.1.1.1, S11.A.1.1.4, S8.A.2.1.1, 3.1.12.C, 3.4.12.C	Concept: **e,g,h) rotational momentum and concepts** S11.C.3.1.1, S11.A.1.3.1, S8.A.2.1.2, S11.A.3.3.1, S11.A.3.3.3, S11.A.1.1.4, 3.4.12.C	Concept: **i) work** S11.A.1.3.1, S8.A.2.1.2, S11.A.1.1.4, S11.C.3.1.2, 3.4.12.C
Lesson Essential Question(s): Why is the total momentum in an isolated system conserved? (A)	**Lesson Essential Question(s):** How can rotational inertian and angular volocity of an object be represented in terms of its angular momentum and kinetic energy? (A) How does the product of an object's angular speed and rotational inertia change in a closed system? (A) What are some situations in which rotational and translational kinetic energy are both present? (A)	**Lesson Essential Question(s):** How do we calculate work in terms of kinetic energy? (A)
Vocabulary: Isolated	**Vocabulary:**	**Vocabulary:**

Concept: **j,k) SHM PE/KE** S11.A.1.3.1, S8.A.2.1.1, S8.A.2.1.2, S8.A.2.1.4, S11.A.3.3.1, S11.A.3.3.3, S11.A.1.1.4, S11.C.3.1.2, 3.1.12.C, 3.4.12.C	Concept: **l) scale** S8.A.2.1.1, 3.4.12.C	Concept:
Lesson Essential Question(s): Where is kinetic energy maximized in simple harmonic motion oscillations? (A) Where is potential energy maximized in simple harmonic motion oscillations? (A)	**Lesson Essential Question(s):** How is conservation of energy applied macroscopically and microscopically? (A) How is conservation of momentum applied macroscopically and microscopically? (A) How is conservation of angular momentum applied macroscopically and microscopically? (A)	**Lesson Essential Question(s):**
Vocabulary:	**Vocabulary:**	**Vocabulary:**

Additional Information:
Attached Document(s):