

# CONCEPT AND SKILL SYNTHESIS OF NGSS STANDARDS

## MIDDLE SCHOOL GRADES 6-8

### Key:

- Concepts and skills are organized cognitively according to generality, complexity, and abstractness. The accompanying documents of *Concept and Skill Analysis* show the complete comprehensive structures and how the NGSS standards fit therein.
- Grayed, small font: No standards are allocated, but the concept/skill is an intermediate level in a comprehensive structure of concepts/skills.
- Percentages show how many of the NGSS standards were allocated to the basic concept.

<b>UNDERLYING TRANSFERABLE CONCEPTS</b>			
BASIC CONCEPT	SUB-CONCEPT		SUB-SUB-CONCEPT
LANGUAGE OF SCIENCE  34% of all standards	ENTITY, SYSTEM, MATTER	HIERARCHY OF MATTER	MOLECULAR SCALE
		HIERARCHY OF LIFE	CELLULAR SCALE
	PROPERTY/MEASUREMENT		SCALE/SIZE
	CHANGE/ PROCESS		SEQUENCE of EVENTS, TIME, RATE
			CYCLE
		CORRELATION, CAUSALITY	
INTERDEPENDENCE/ ECOSYSTEM 19%	NATURAL ENVIRONMENT		
	COMPLEMENTARITY		
ENERGY & ENERGY RESOURCES  8%	ENERGY FORMS & TRANSFORMATION		POSITION (GRAVITATIONAL) ENERGY, KINETIC ENERGY
			THERMAL, CHEMICAL ENERGIES
	HEAT TRANSFER		
WAVES 5%	PRODUCTION, ABSORPTION, PROPAGATION		INTERFACE
CHEMICAL REACTION 7%			
REPRODUCTION, HEREDITY 3%	SEXUAL, ASEXUAL REPRODUCTION		
	GENETIC CODE, CODE		
EVOLUTION 10%	SELECTION		
MOTION and FORCES 7%	ACCELERATION, NEWTON'S 2 <sup>ND</sup> LAW		
ELECTRICITY AND MAGNETISM 2%			

<b>UNDERLYING TRANSFERABLE SKILLS</b>		
MAJOR SKILL	SUB-SKILL	SUB-SUB-SKILL
THE DESIGN PROCESS  12%	IDENTIFY PROBLEM/GOAL	CRITERIA, CONSTRAINTS
	CONSTRUCT SOLUTION or PROTOTYPE	
	EVALUATE SOLUTION	