

Diagnostic Teacher Assessments in Science--2003

DTAMS Science Content Summary Chart														
Student Information						Teacher Information						S	T	A
	AAAS	NSES	MeRel	NAEP	TIMSS**	Research	NSTA (D)	INTASC	PRAXIS	Research				
A. LIFE SCIENCES														
1. Structure/Function of Living Systems														
a. complimentary nature of structure and function	X	X	X	X	X	X	X	X	X		6	3	9	
b. cells	X	X	X		X		X	X	X		4	3	7	
c. animal organ systems	X	X	X	X	X	X	X	X	X	X	6	4	10	
d. plant organ systems	X	X	X	X	X		X	X	X		5	3	8	
e. cellular communication (hormones)	X	X	X	X	X		X	X	X		5	3	8	
f. increase in complexity: cell-tissue-organ	X	X	X	X	X		X		X		5	2	7	
g. immune system and disease fighting	X			X	X				X		3	1	4	
2. Regulation and Behavior														
a. obtain and use resources (autotrophy vs. heterotrophy)	X	X	X	X	X		X		X		5	2	7	
b. organisms convert energy (autotrophy/heterotrophy)	X	X	X	X	X		X	X	X		5	3	8	
c. homeostasis	X	X	X	X	X		X	X	X		5	3	8	
d. behavior from cellular to organismic levels		X	X	X	X		X		X		4	2	6	
e. adaptations	X	X	X	X	X		X	X	X		5	3	8	
3. Reproduction and Heredity														
a. plant and animal reproduction (sexual & asexual)	X	X	X	X	X		X		X		5	2	7	
b. genetics		X	X	X	X	X	X	X	X	X	5	4	9	
c. fitness and survival (nature vs. nurture)	X	X	X	X	X		X	X			5	2	7	
4. Diversity and Adaptation of Organisms														
a. change over time (evolution)	X	X		X	X	X	X	X	X	X	5	4	9	
b. extinction	X	X		X	X		X		X		4	2	6	
c. five kingdoms				X	X		X		X		2	2	4	
5. Ecology/Populations														
a. photosynthesis	X	X	X	X	X	X	X	X	X	X	6	4	10	
b. cycling of nature	X	X	X	X	X		X	X	X		5	3	8	
c. biomes/ ecosystems	X	X	X	X	X		X	X	X		5	3	8	
d. consumer vs. decomposer vs. mutualism	X	X	X	X	X		X	X	X		5	3	8	
e. conservation and protecting the environment	X			X	X		X	X			3	2	5	

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B. EARTH AND SPACE SCIENCE													
1. Structure of the Earth System													
a. Earth's layers	X	X	X	X	X	X	X		X	X	6	3	9
b. movements of plates/earthquakes/volcanoes	X	X	X	X		X	X		X	X	5	3	8
c. constructive/destructive forces	X	X	X	X		X	X		X	X	5	3	8
d. rock/mineral cycle	X	X	X	X	X	X	X		X	X	6	3	9
e. soil structure	X	X	X	X	X	X	X		X		6	2	8
f. water cycle	X	X	X	X	X	X	X		X	X	6	3	9
g. water properties	X	X	X	X		X	X				5	1	6
h. atmosphere composition	X	X	X	X	X	X	X		X		6	2	8
i. cloud formation	X	X	X			X	X		X		4	2	6
j. climate & oceans	X	X	X	X	X	X	X		X	X	6	3	9
k. weather/weather hazards		X	X	X	X	X			X	X	5	2	7
l. global wind/circulation/air mass									X		0	1	1
m. living orgs in earth systems	X	X									2	0	2
2. Technology/Society													
a. natural resources/technology used by humans	X	X		X	X			X	X		4	2	6
3. History of Earth													
a. Earth processes/uniformitarianism/geologic time	X	X	X		X	X	X		X	X	5	3	8
b. catastrophic events	X	X				X	X		X	X	3	3	6
c. fossils as evidence	X		X		X	X	X		X	X	4	3	7
4. Earth in the Solar System													
a. solar system	X	X	X	X	X	X	X		X	X	6	3	9
b. phases, motion and eclipses	X	X	X	X	X	X	X		X	X	6	3	9
c. gravity and tides	X	X	X				X		X	X	3	3	6
d. sun as energy and reason for seasons	X	X	X	X	X	X	X			X	6	2	8
5. Inquiry and Nature of Science	X	X		X	X	X	X	X	X	X	5	4	9

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C. PHYSICAL SCIENCES													
1. Properties and changes of properties in matter													
a. Chemical properties (den., boiling pt, solub.)		X	X		X		X		X		3	2	5
b. Mixtures	X	X	X	X	X		X		X		5	2	7
c. chemical reactions (& compounds)	X	X	X	X	X	X	X	X	X	X	6	4	10
d. conservation of mass	X	X	X		X		X		X		4	2	6
e. chemical families	X	X	X				X		X		3	2	5
f. elements	X	X	X				X		X		3	2	5
g. Atomic structure					X			X	X		1	2	3
h. states of matter, kinetic theory, and gas laws	X		X	X	X	X	X		X	X	5	3	8
2. Motions and forces													
a. position and direction of moving things	X	X	X		X		X	X	X		4	3	7
b. speed	X	X	X					X	X		3	2	5
c. graphical representation of motion		X	X		X			X	X		3	2	5
d. force, including friction, weight, and $a=F/m$		X	X	X	X			X	X		4	2	6
e. Newton's First Law of Motion (inertia)		X	X		X		X	X	X		3	3	6
f. addition of forces, unbalanced forces	X	X	X				X	X	X		3	3	6
g. gravity			X	X	X	X	X		X		4	2	6
3. Transfer of energy													
a. energy	X	X	X				X	X	X		3	3	6
b. thermodynamics & heat (movement of heat)	X	X	X	X	X	X	X	X	X	X	6	4	10
c. light (refraction, absorption, scattering & reflection)	X	X	X	(X)	X	X	X	X	X	X	6	4	10
d. electricity (static, current, & electric circuits)	X	X	X	X	X	X	X		X	X	6	3	9
e. mechanical motion (KE & PE)		X	X				X	X	(X)		2	3	5
f. sound & waves	X	X	X	X	X	X	X	X	X	X	6	4	10
g. nuclear (radioactivity, fusion, fission)	X	X	X				X		X		3	2	5
h. chemical	X	X	X				X		X		3	2	5
i. energy transfer (systems, conservation, W, P)	X	X	X	X			X	X	X		4	3	7
j. EM spectrum and sunlight	X	X	X	X	X		(X)	X	X		5	3	8
k. simple machines					X		X		X		1	2	3
l. magnetism		X	X	X	X	X	X		X	X	5	3	8
m. temperature and scales		X	X	X	X	X			X	X	5	2	7
n. color and vision	X	X	X		X	X	X			X	5	2	7

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D. SCIENTIFIC METHODOLOGY														
a. scientific investigation-steps	X			X	X		X	X				4	2	6
b. single variable	X			X	X		X	X				4	2	6
c. objectivity	X			X	X		X	X				4	2	6
d. scientific knowledge changes over time	X			X	X		X	X				4	2	6
e. data collection and analysis				X	X		X	X				3	2	5
E. UNIFYING CONCEPTS AND PROCESSES														
1. Systems, order, and organization														
a. systems (organization, properties, and functions)		X										1		1
b. nature is understandable and predictable		X										1		1
c. theories and laws		X										1		1
d. order: cause & effect		X										1		1
e. prediction (and math & probability)		X										1		1
f. probability and statistics		X										1		1
g. models		X										1		1
h. types and levels of organization		X										1		1
2. Evidence, models, and explanation														
a. evidence (observations and data)		X										1		1
b. use of evidence for prediction		X										1		1
c. models		X										1		1
d. types of Scientific explanations (hypothesis, model, law, principle)		X										1		1
e. quantification		X										1		1
3. Constancy, change, and measurement														
a. changes (rate, scale, patterns)		X										1		1
b. constancy & conservation principles		X										1		1
c. quantification		X										1		1
d. measurement systems (metric)		X										1		1
e. scale		X										1		1
f. rate		X										1		1
4. Evolution and equilibrium														
a. evolution (gradual and sporadic)		X										1		1
b. equilibrium		X										1		1
5. Form and function														
a. form		X										1		1
b. functions		X										1		1
c. relationships between form and function		X										1		1
F. SCIENCE AS INQUIRY														
1. Abilities necessary to do scientific inquiry														
		X										1		1
2. Understandings about scientific inquiry														
		X										1		1