Accountability
  linkage with assessments for classroom learning, 283-287
  versus instructional guidance, 223-224
ACT-R research group, 185
Adventures of Jasper Woodbury video series, 275
Alternative assessment practices, 29-30, 242-248
AP Studio Art, 246-247
DIAGNOSER, 96, 247-248
Maryland State Performance Assessment Program, 245-246
National Assessment of Educational Progress (NAEP), 244-245
American Institutes for Research, 208
AmericaQuest, 267
Analysis
  of errors, 207
  ethnographic, 101
  microgenetic, 100-101
  of protocols, 99-100, 207
  of reasons, 207
AP Studio Art, 246-247
Aptitude, assessment of, 37
Aristotelian perspective, 206
Arithmetic
  keymath diagnostic test, 139
  models of learning, 94-95
Assessment, 15-54. See also Alternative assessment practices; Classroom formative assessment; Educational assessment; Modern assessment practices; Purposes of assessment as an instrument of reform, 24-25 analyzing existing, 12, 303-304 of aptitude, 37 balanced system, 253-257 
matrix sampling, 13, 307
moderation, 117
potential future role of Bayes nets in, 164-165
in practice, 7-9, 220-259
precision and imprecision in, 42
publicizing its importance in improving learning, 14, 312-313
quality of feedback in, 234-236
and reasoning from evidence, 2-3, 42-43
reporting results of, 212-214
rethinking, 17-35
scientific foundations of, 55-172
static nature of current, 27-28
summative, 38
tasks, 116
using to assist learning, 7-8, 37-38
Assessment design, 173-288
enhancing overall process of, 270-271
funding research into improved, 11-12, 299-301
implications of new foundations for, 6-7, 176-219
inevitability of trade-offs in, 222-223
task-centered versus construct-centered approaches, 194
Assessment instruments. See also Large-scale assessment
developers of, focusing on cognition, observation, and interpretation, 13, 305-306
task sets and assembly of, 200-202
Assessment systems, 252-257. See also BEAR assessment system
balance between classroom and large-scale assessment, 252-253
Assessment triangle, 19, 44-51, 263-271, 282, 296
cognition, 44-47
cognition-interpretation linkage, 51
cognition-observation linkage, 51, 263-269
interpretation, 48-49
observation, 47-48
observation-interpretation linkage, 51, 269-270
relationships among the three vertices of, 49, 51
Associationist perspective. See Behaviorist perspective
Australia’s Developmental Assessment program, 190-192

B
Balance-scale problems, solving, 49-50
Balanced assessment systems, 253-257
approximations of, 257
between classroom and large-scale, 252-255
coherence of, 255-256
comprehensiveness of, 253-255
continuity of, 256-257
Base rate probabilities, 161
of subprocedure profile, 161
Bayes nets, 154-165
mixed-number subtraction, 156-164
potential future role in assessment, 164-165
Bayes theorem, 155
BEAR. See Berkeley Evaluation and Assessment Research Center
BEAR assessment system, 115-117
sample progress map from, 119
sample scoring guide for, 118
Behaviorist perspective, on knowing and learning, 61-62
Beliefs. See Student beliefs
Berkeley Evaluation and Assessment Research (BEAR) Center, 115
Blueprints, 116
Brain research
cognition and, 104-109
cognitive architecture and, 68-69
into enriched environments and brain development, 105-107
into hemispheric specialization, 104-105
implications for assessment, 107-109
Bridging research and practice, 294-296

C
CGI. See Cognitively Guided Instruction
Change, models of, 128-134, 165-168
Changing expectations for learning, 21-25
higher standards and high-stakes tests, 23-25
societal, economic, and technological changes, 22-23
Chess experts, meaningful units as encoded by, 74-75
Children
assessing problem-solving rules of, 46-47
coming to understand the whole number system, 180-181
naive conceptions of, 83
Piagetian stages of development, 151
strategies for simple addition, 86
Classical test theory (CTT), 120-121
Classification, social context of, 88
Classroom assessment, 8-9, 225-241
balancing with large-scale assessment, 252-253
cognitively based approaches to, 230-233
fairness in, 240-241
learner’s role in, 236-240
new forms of, 12, 301-303
quality of feedback, 234-236
teacher’s role in, 234
transforming, 226-228
Classroom Connect, 267
Classroom formative assessment, 38
facilitating, 272-274
mandates and resources placing increasing emphasis on, 14, 310-312
CLP. See Computer as Learning Partner
Cognition, 65-72
analyzing in existing assessments, 12, 305-306
and brain science, 104-109
developers of assessment instruments focusing on, 13, 305-306
implications for assessment, 71-72
importance of a model of, 6, 178-192, 229-230
as part of the assessment triangle, 44-47
Cognition-observation linkage, 51
complex problem solving, 265-269
concept organization, 265
enhancing, 263-269
theory-based item generation, 263-265
Cognitive architecture, 65-69
and brain research, 68-69
long-term memory, 67-68
working memory, 65-67
Cognitive coherence
among curriculum, instruction, and assessment, 271-283
of balanced assessment, 255-256
Cognitive complexity, of science tasks, 210-211
Cognitive elements in existing measurement models
enhancement through diagnostics, 137, 142-147
incorporation of, 134-147
progress maps, 136-142
Cognitive models of learning
of arithmetic, 94-95
for assessing children’s problem-solving rules, 46-47
and debugging of computer programs, 95-96
implications for assessment, 96-97
integrating with instruction and assessment, 92-97
and intelligent tutoring, 93
Cognitive perspective, on knowing and learning, 62-63
Cognitive sciences
defined, 20
making advances available to educators, 11, 299
Cognitive structures
adding to measurement models, 147-152
psychometric modeling of, 152-165
Cognitively Guided Instruction (CGI), 95, 234
and assessment, 230-231
Collaboration, recommendation for multidisciplinary, 11
Committee on Learning Research and Educational Practice, 294
Committee on the Foundations of Assessment, 1, 17, 291
Comparable validity, 214
Competencies. See Student competencies
Complex problem solving, 265-269
Complex solution strategies, analysis of, 270
Comprehensiveness, of balanced assessment system, 253-255
Computational modeling and simulation, 99
Computer as Learning Partner (CLP), 278-279
Computer programs, debugging, 95-96
Concept organization, 265
Conceptual frameworks, 271
Conceptual scheme, to guide thinking and discussion, 11
Concurrent verbal protocols, 99
Conditional independence, 114
Conditional inference
methods of, 218
versus unconditional, 215-216
Conditional probabilities, 159
Connecticut Common Core of Learning Assessment Project, 210
Connectionist networks, model of long-term memory, 67-68
ConQuest software, 134
Construct-centered approach, to assessment design, 194
Construct variables, 112
Contemporary assessment. See Modern assessment practices
Content-process space, 208
Continuity, of balanced assessment system, 256-257
Continuous latent variables, modeling of change in, 133-134
Control-of-variables strategy, assessment of, 216-217
Coordinated systems, of multiple assessments, 252
CoVis (Learning Through Collaborative Visualization) project, 279
Criterion-referenced testing, 214
Crystallized intelligence, 66
CTT. See Classical test theory
Cultural norms, impact on expertise, 90
Curriculum assessment linked with, 51-53
developers of, creating tools to facilitate modern assessment practices, 13, 306-307
formative assessment in, 228-229
Curriculum and Evaluation Standards for School Mathematics, 209
Curriculum-embedded assessment, 13, 243
Developmental continua. See Progress maps
DIAGNOSER, 96, 203, 247-248, 273
Diagnostic arithmetic test, keymath, 139
Diagnostic indices
IEY diagnostic results, 146
incorporated into measurement models, 137, 142-147
KIDMAP, 144-145
DIF. See Differential item functioning
Differential item functioning (DIF), 148, 215
Differential perspective, on knowing and learning, 60-61
DISC. See Dental Interactive Simulation Corporation
Discrete latent variables, modeling of change in, 134
Discussion. See also Multidisciplinary discourse communities
critical scheme and language to guide, 11
Distributed learning, 285
Domain-general knowledge, and problem-solving processes, 69-70
Dyslexia, neural bases of, 108-109

E
Economic change, and changing expectations for learning, 22-23
Educational assessment defined, 20
opportunities for advancing, 9-10, 260-288
providing instruction in for teachers, 14, 309-310
purposes and contexts of use, 222-225
Educational curricula, developers of, creating tools to facilitate modern assessment practices, 13, 306-307
Educational decision making, studying how new forms of assessment affect, 12, 301-303
Educational reform assessment as an instrument of, 24-25
facilitating, 34
Educational Testing Service, 271
Educators. See Teacher education
Environments. See also Learning environments
enriched, and brain development, 105-107
Equity issues, in linkage of assessments, 286-287
Estimates, assessment results as, 42
Ethnographic analysis, 101
Evaluation. See Assessment
Evidence, reasoning from, 2-3, 36-54, 112-117
Exemplars, 116
Expanding views of knowing and learning, 59-65
the behaviorist perspective, 61-62
the cognitive perspective, 62-63
the differential perspective, 60-61
points of convergence among, 64-65
the situative perspective, 63-64
Expectations for learning
changing, 21-25, 33
in large-scale assessment, 249-250
Expertise, 79-92. See also Novices and experts
impact of cultural norms and student beliefs, 90
implications for assessment, 90-92
multiple paths of learning, 81-83
practice and feedback, 84-87
role of prior knowledge, 83-84
role of social context, 88-89
transfer of knowledge, 87-88
Eye-movement tracking, 96
Fluid intelligence, 66
fMRI. See Functional magnetic resonance imaging
Formal measurement models
as a form of reasoning from evidence, 112-117
reasoning principles and, 113-115
Formative assessment. See Classroom formative assessment
Foundations, defined, 20
Fraction items, skill requirements for, 158
Functional magnetic resonance imaging (fMRI), 68, 108
Funding, needed for research into improved assessment design, 11-12, 299-301
Future of assessment, 292-294
bridging research and practice, 294-297

G
Generalizability theory (G-theory), 121-122
multivariate, 128
with raters and item type, 122
GenScope™, 276, 278, 286-287
Goals, using large-scale assessment to signal, 248-249
GradeMap software, 119, 143
Growth, models of, 128-134
Guessing probability, 153

H
Hemispheric specialization, brain research into, 104-105
Hierarchical factor analysis, 149
Hierarchical linear modeling (HLM), 133
Hierarchical measurement models, 148-152
combining classes and continua, 151-152
High Stakes: Testing for Tracking, Promotion, and Graduation, 39, 253
High-stakes tests, and changing expectations for learning, 25-25
HLM. See Hierarchical linear modeling
How Far Does Light Go? project, 280-281
How People Learn, 59
HYDRIVE intelligent tutoring system, 164-165
inference networks for, 169-172
IEY. See Issues, evidence and you curriculum
IEY curriculum, target performance map for, 146
IMMEX (Interactive Multimedia Exercises) program, 270, 273-274
Inclined-plane schemas, novices' and experts' network representations of, 78-79
Individual achievement, using assessment to determine, 38-39
Inference
  conditional versus unconditional, 215-216
  methods of, 97-102, 218
  targets of, 45
Inference networks
  for the HYDRIVE student model, 170
  structure of, 160
Information. See Publicity
Information technology, 22
opportunities for advancing educational assessment, 9-10, 260-288
Instruction
  assessment linked with, 51-53
  formative assessment in, 228-229
  integrating models of cognition and learning with, 92-97
  in learning assessment, providing for teachers, 14, 309-310
Instructional guidance, accountability versus, 223-224
Intelligent tutoring systems, 68, 231-233
  application of Bayes nets in, 169-172
  cognitive models of learning and, 93
  effects on mathematics learning, 232-233
Interpretation
  analyzing in existing assessments, 12, 303-304
  developers of assessment instruments focusing on, 13, 305-306
  as part of the assessment triangle, 48-49
IRM. See Item response modeling
Issues, evidence and you (IEY) curriculum, progress variables from, 116
Item generation, theory-based, 263-265
Item parameters, 113, 119, 154
Item response modeling (IRM), 123-126, 134
  multidimensional, 128-129
  with raters and item type, 126
James S. McDonnell Foundation, 304
KIDMAP, 142, 144-145
Knowing, expanding views of the nature of, 59-65
Knowledge
  domain-general, and problem-solving processes, 69-70
  role of prior, 83-84
  synthesis of existing, 299
  transfer of, 87-88
Knowledge base
  expanding, 299-303
  initial steps for building, 303-305
Knowledge-in-pieces perspective, versus theoretical perspective, 203-206
Knowledge Integration Environment (KIE), 278-281
Knowledge organization
  expert-novice differences in, 72-77
  and schemas, 70-71
Knowledge tracing, 186
Language, to guide thinking and discussion, 11
Large-scale assessment, 8-9, 241-251
  and advances in cognition and measurement, 241-242
  alternative approaches to, 242-248
  AP Studio Art, 246-247
  balancing with classroom assessment, 252-253
  feedback and expectations for learning, 249-250
  increasing spending on, 24
  Maryland State Performance System, 245-246
  National Assessment of Educational Progress, 244-245
  New Standards Project, 250-251
  sampling wider range of student competencies, 13, 307-308
  using to signal worthy goals, 248-249
Large-scale contexts, making new forms of assessment practical in, 12, 301-303
Latent class models, 126-127
ordered, 127
Latent semantic analysis (LSA), 269, 274
Latent variables
continuous, modeling of change in, 133-134
discrete, modeling of change in, 134
stage-sequential dynamic, 135
LCAG software, 134
Learner’s role, in classroom assessment, 236-240
Learning. See also Expectations for learning;
Student competencies
advances in the science of, 3-5, 58-109
changing expectations for, 21-25
cognitive model of, 46-47
distinguished from development, 80
expanding views of the nature of, 59-65
impact of prior theories of, 25-30
impact of reflective inquiry on, 238-239
importance of a model of, 6-7, 178-192, 229-230
linkage of assessments for, 283-287
models of, integrating with instruction and assessment, 92-97
multiple paths of, 81-83
predisposition to, 80
principles for structuring, 87
problem-based, 276
publicizing the importance of assessment in improving, 14, 312-313
social context of, 89
using assessment to assist, 7-8, 37-38
Learning environments, technology-enhanced, 274-283
Learning Through Collaborative Visualization (CoVis) project, 279
Limitations of current assessment, 26-29
making policy makers aware of, 14, 310-312
Linear models, families of, 131-132
Link tests, 116
Linkage of assessments
for classroom learning and accountability, 283-287
equity issues in, 286-287
policy issues in, 285-286
pragmatic issues in, 286
privacy issues in, 287
LISP tutor, 164
Logistic regression, 148
LOGO language, 95
Long-term memory, 2, 67-68
production systems model of, 67-68
LSA. See Latent semantic analysis

M
“Magic Number Seven” argument, 66
Mandates, increasing emphasis on classroom formative assessment, 14, 310-312
Maryland State Performance Assessment Program (MSPAP), 245-246
MashpeeQuest performance task, 267-268
Mathematics
effects of an intelligent tutoring system on learning, 232-233
student beliefs about the nature of, 91
Mathematics Test Creation Assistant, 263-264
Matrix sampling, 13, 248
Meaningful units, as encoded by chess experts, 74-75
Measurement models, 5-6, 112
adding cognitive structure to, 147-152
addition of new parameters, 148
formal, 112-117
hierarchization of, 148-152
incorporation of cognitive elements in existing, 134-147
standard, 117-127
Measurement science
contributions to assessment, 5-6, 110-117
facets of, 121
impact of prior theories of, 25-30
making advances from available to educators, 11, 299
Media, publicizing the importance of assessment in improving learning, 14, 312-313
Mediated activity, 63
Memory
contents of, 69-71
domain-general knowledge and problem-solving processes, 69-70
long-term, 67-68
schemas and the organization of knowledge, 70-71
working, 65-67
Metacognitive skills, importance of, 4, 78-79, 281
Microgenetic analysis, 100-101
Middle School Mathematics Through Applications Project, 187-189
Mixed-number subtraction, Bayes net analysis of, 156-164
Mixture model approach, 151
Model tracing, 186
“Model tracing,” 167
Modeling
  computational, 99
  psychometric, of cognitive structures, 152-165
  statistical, 5-6, 110-172
  of strategy changes, 165-168
Models of change and growth, 128-134
modeling of change in continuous latent variables, 133-134
modeling of change in discrete latent variables, 134
true-score modeling of change, 130-133
Models of cognition and learning, 185-192
Australia’s Developmental Assessment program, 190-192
Facets-based instruction and learning, 186-189, 202-206
Middle School Math Through Applications Project, 187-189
PAT algebra tutor, 185-186
Modern assessment practices, 30-32
developers of educational curricula creating tools to facilitate, 13, 306-307
publicizing, 14, 312-313
Monotonic development, cumulative, in a stage-sequential dynamic latent variable, 135
MOOSE Crossing, 279
“Mozart effect,” 105-107
MFRMCL, unified model and, 152-154
Multiatribute models, 128
Multidimensional item response model, 129
Multidisciplinary discourse communities, establishing, 11-13, 304-305
Multiple assessments
  coordinated systems of, 252
  developing new systems of, 14, 310-312
Multiple-choice questions, to test for theoretical versus knowledge-in-pieces perspective, 204-205
Multiple paths, of learning, 81-83
Multivariate G-theory, 128

N
NAEP. See National Assessment of Educational Progress
National Academy of Education, 298
National Assessment of Educational Progress (NAEP), 40, 90, 124, 200, 224, 244-245
National Board of Medical Examiners, 270
National Council of Teachers of Mathematics, 23, 275
National Education Research Policies and Priorities Board, 298
National Institute of Child Health and Human Development, 299
National Institute of Mental Health, 108
National Institute on Aging, 108
National Research Council (NRC), 17, 23, 39, 59
  Committee on Learning Research and Educational Practice, 294
National Science Foundation (NSF), 1, 17, 291, 299, 304
Neural bases of dyslexia, 108-109
New Standards Project, 23, 250-251
Newell-Dennett framework, 153
Newtonian perspective, 203
Norm-referenced results, 213
Novices and experts
  differences in, 4, 72-77
  network representations of inclined-plane schemas, 78-79
NRC. See National Research Council
NSF. See National Science Foundation
Number Knowledge Test, 196-199

O
Object models, 271
Observation
  analysis of protocols for, 99-100
  analyzing in existing assessments, 12, 303-304
  and computational modeling and simulation, 99
  developers of assessment instruments focusing on, 13, 305-306
  ethnographic analysis, 101
  implications for assessment, 101-102
  methods of, 97-102
  microgenetic analysis, 100-101
  as part of the assessment triangle, 47-48
of problem-solving rules in children,
methods for, 49
and reaction-time studies, 98-99
of student performance, interpreting, 50
Observation-interpretation linkage, 51
analysis of complex solution strategies,
270
enhancing, 269-270
text analysis and scoring, 269
Observation models, 112
Office of Education Research and
Improvement, National Education
Research Policies and Priorities
Board, 298
OLEA tutor, 164

P

PANMARK software, 134
Parallel distributed processing (PDP)
systems, model of long-term memory, 68
Pasteur’s Quadrant, 298
PAT algebra tutor, 185-186, 232
PDP. See Parallel distributed processing
systems
Performance maps
for Designing and Conducting
Investigations, 125
for the IEY curriculum, 146
PET. See Positron emission tomography
Physics examination, components of A-level, 254
Physics problems, sorting of, 76
Piagetian stages, of child development, 151
“Plan recognition,” 167
Policy issues, in linkage of assessments, 285-286
Policy makers
recognizing limitations of current
assessments, 14, 310-312
recommendations for, 305-312
Positron emission tomography (PET), 68, 108
Power law of practice, 85
Practice, in expertise, 84-87
Pragmatic issues, in linkage of assessments,
286
Precision and imprecision, in assessment, 42
Predictive tests, 18
Predisposition to learn, 80
Prior knowledge, role in expertise, 83-84
Privacy issues, in linkage of assessments, 287
Private-sector organizations, establishing
multidisciplinary discourse
communities, 12-13, 304-305
Probabilities
base rate, 161
updated, 162
Problem-based learning, 276
Problem solving
assessing in children, 46-47
complex, 265-269
domain-general knowledge, 69-70
methods for observing in children, 49
weak methods versus strong, 69-70
Production systems, 99
model of long-term memory, 67-68
Professional development programs,
providing instruction in learning
assessment, 14, 309-310
Profile strands. See Progress maps
Progress maps, 117, 137, 190
BEAR assessment system, 119
cognitive elements in existing
measurement models, 136-142
for counting and ordering, 191-193
dkeymath diagnostic arithmetic test, 139
of national writing achievement, 140-142
reporting individual achievement in
spelling, 138
Progress variables, 115-117
from the issues, evidence and you
curriculum, 116
Progressions of developing competence. See
Progress maps
Protocols
analyzing, 207
concurrent verbal, 99
for observation and inference, 99-100
Psychological Tests and Personnel Decisions, 222
Psychometric modeling of cognitive
structures, 152-165
Bayes nets, 154-165
unified model and MFRMCL, 152-154
Public opinion, recommendations regarding,
312-313
Publicity, on the importance of assessment
in improving learning, 14, 312-313
Purposes of assessment, 37-42
to assist learning, 37-38
to determine individual achievement, 38-39
INDEX

364

to evaluate programs, 40
multiple, 225
reflecting on, 40-42

Q

QUASAR Cognitive Assessment Instrument, 209, 211-212

R

Rasch models, 124
Raven’s Progressive Matrix Test, 66
Reaction-time studies, 98-99
Reasoning from evidence, 2-3, 36-54
assessment as a process of, 42-45
formal measurement models as, 112-117
Reasoning principles, and formal
measurement models, 113-115
Recommendations, 10-14, 297-313
for policy and practice, 13-14, 305-313
for research, 11-13, 297-305
Recursive representations, 159
Reference Exam, 251
Reflective inquiry, impact on learning, 238-
239
Reform. See Educational reform
Reliability, 39, 120
Research, for improved assessment design,
need to fund, 11-12, 299-301
Resources, increasing emphasis on
classroom formative assessment, 14,
308, 310-312
Revising tasks, 212-213
Role of prior knowledge, on expertise, 83-84
Rule assessment method, 48
Rule-space representation, 143

S

Schemas, and the organization of
knowledge, 70-71
Science and mathematics, disparities in
access to quality instruction in, 18
Science standards, 23-24
Scientific foundations, of assessment, 55-172
Scientists in Action video series, 275
Scoring guides, 116
SEM. See Structural equation modeling
Short-term memory. See Working memory
Simulation, computational, 99
Situative perspective, on knowing and
learning, 63-64
Skill acquisition curves, 86
Skill requirements, for fraction items, 158
“Slip probability,” 153
SMART (Scientific and Mathematical Arenas
for Refined Thinking) Model, 275-277
web-based resources for, 277
Social context, role in expertise, 88-89
Societal change, and changing expectations
for learning, 22-23
Solution strategies, analysis of complex, 270
Sorting, of physics problems, 76
Spatial navigation, 105
Spelling, progress maps reporting individual
achievement in, 138
SRI International, 267
Standard psychometric models, 117-128
classical test theory, 120-121
generalizability theory, 121-122
item response modeling, 123-126
latent class models, 126-127
multiattribute models, 128
Standards-based reform, 33
Standards for Educational and Psychological
Testing, 177
Standards for learning, rising, and changing
expectations, 23-25
Statistical modeling, contributions to
assessment, 5-6, 110-172
Stones River Mystery, 275-276
Strategy changes, modeling of, 165-168
Strong methods, of problem solving, 69-70
Structural equation modeling (SEM), 133
Student beliefs
about the nature of mathematics, 91
impact on learning, 90
Student competencies
Large-scale assessments sampling wider
range of, 13, 307-308
rethinking ways to assess, 27-28
Student learning
accountability versus instructional
guidance for, 223-224
studying how new forms of assessment
affect, 12, 301-303
Student performance
evaluation of, 197, 200
interpreting observations of, 50
Subject-matter expertise, 72-79
  expert-novice differences in knowledge organization, 72-77
  implications for assessment, 79
  importance of metacognition, 78-79
Subprocedure profile
  base rate probabilities of, 161
  updated probabilities of, 163
Subtraction, of mixed-numbers, 156-164
Subtraction bugs, 183
  using sets of items to diagnose, 201
Summative assessment, 38
Systems of multiple assessments, developing new, 14, 253-257, 310-312

T
Target performance map, for the IEY curriculum, 146
Targets of inference, 45
Task-centered approach, to assessment design, 194
Task design, guided by cognitive and measurement principles, 193-196
Task validation, 7, 206-213
  approaches to, 207-209
  QUASAR Cognitive Assessment Instrument, 209, 211-212
Teacher education, providing instruction in learning assessment, 11, 14, 299, 309-310
Teacher practice, studying how new forms of assessment affect, 12, 301-303
Teacher’s role, in classroom assessment, 234
Technological change. See also Information technology
  and changing expectations for learning, 22-23
Technology-enhanced learning environments, 274-283
  assessment issues and challenges for, 279-283
  CoVis (Learning Through Collaborative visualization) project, 279
  GenScope™, 276, 278, 286-287
  Knowledge Integration Environment, 278-279
  MOOSE Crossing, 279
  SMART Model, 275-277
  Test Creation Assistant, 263-264
  Testing. See Assessment
  Testing in American Schools, 25
  Text analysis and scoring, 269
  Theoretical perspectives, versus knowledge-in-pieces, 204-205
  Theory-based item generation, 263-265
  ThinkerTools Inquiry Project, 96, 237-240, 265, 273
  Thinking advances in the science of, 3-5, 58-109
    conceptual scheme and language to guide, 11
  Time-structured data, 133
  Tools to facilitate modern assessment practices, 263-271. See also individual programs and software packages
    cognition-observation linkage, 51, 263-269
    developers of educational curricula creating, 13, 306-307
    observation-interpretation linkage, 51, 269-270
    recommendations regarding, 305-308
    supporting, 271
  Trade-offs in assessment design
    accountability versus instructional guidance for individual students, 223-224
    inevitability of, 222-223
  Transfer of knowledge, 87-88
  Transforming classroom assessment, 226-228
  Triangle. See Assessment triangle
  True-score modeling of change, 120, 130-133
  Tutoring. See Intelligent tutoring

U
Understanding. See Learning; Student competencies
Unidimensional-continuous constructs, 120
Unified model, 153
  and MRMCL, 152-154
Updated probabilities, 162
  of subprocedure profile, 163
V

“V-known” option, 133
Validation. See Task validation
Validity, 39
Variables. See also Control-of-variables strategy
construct, 112
latent, 133-134
progress, 115-117
Voluntary National Test, 208

W

Weak methods, of problem solving, 69-70
Whole number system, children coming to understand, 180-181
Working memory, 65-67
Worthy goals, using large-scale assessment to signal, 248-249
Writing achievement, progress maps of national, 140-142