

The Living Book of **Biology**



INTRODUCTION TO BIOLOGY

LESSON 2: CHARACTERISTICS OF LIVING THINGS

THE SEVEN SIGNS OF LIFE



1

Living Things Are Made of Cells



Cells



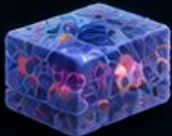
Single-Celled
Organisms



Many-Celled
Organisms



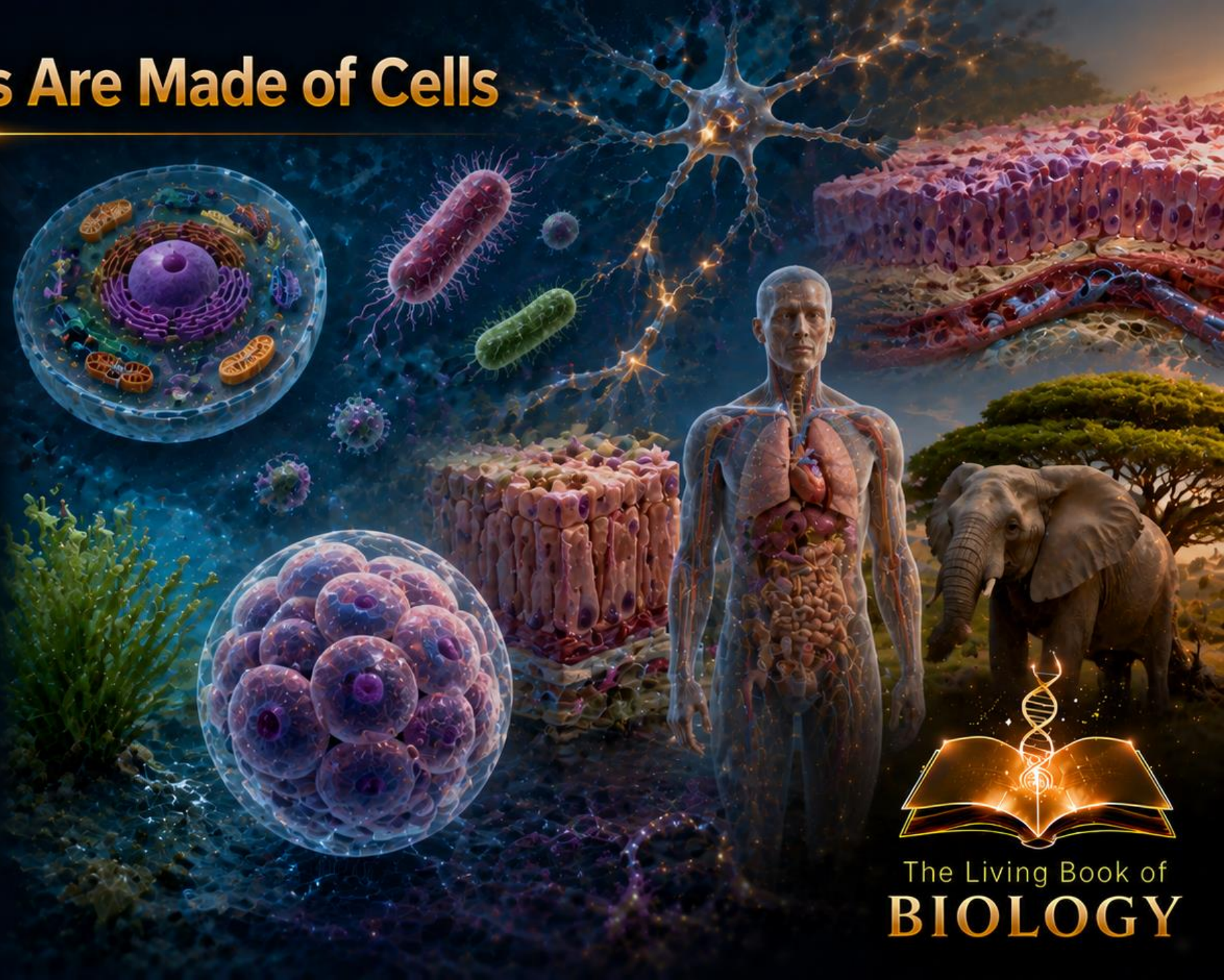
Specialized Cells



Tissues and
Organs



Complex
Organisms



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2 Living Things Obtain and Use Energy



Energy Sources



Photosynthesis



Nutrition



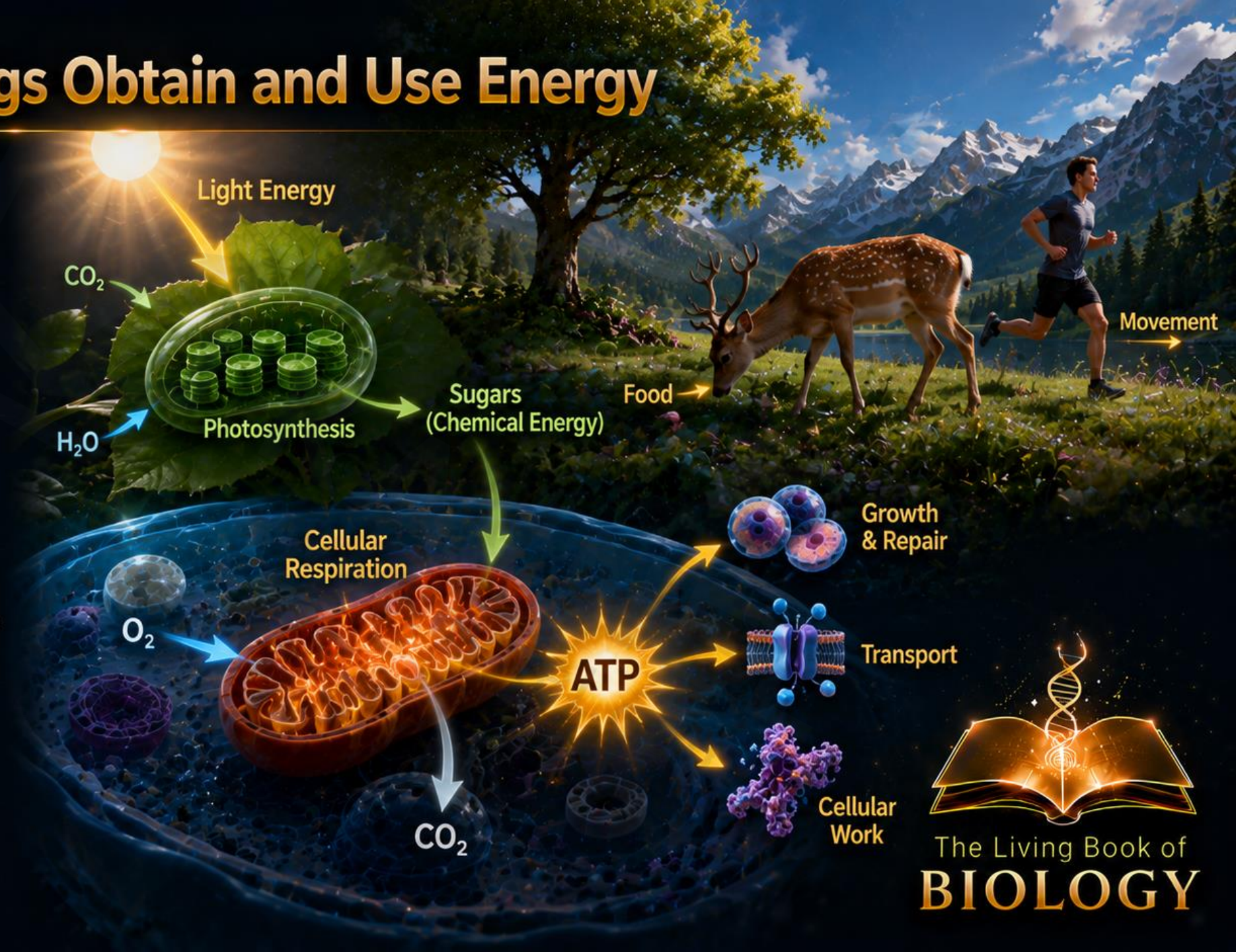
Cellular Respiration



Metabolism



Energy for Life



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3 Living Things Grow and Develop



Growth



Cell Division



Genes



Development



Specialization



Complex Organization



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4

Living Things Respond to Their Environment



Stimuli



Detection



Response



Plant Responses



Animal Behaviors



Survival Advantage

PLANT RESPONSE TO LIGHT



BRIGHT LIGHT

DIM LIGHT



THREAT



RESPONSE

FLEE

TOUCH



LEAF FOLDS

ROOT GROWS TOWARD WATER



BEHAVIOR CHANGE



Camouflage for protection



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5

Living Things Maintain Homeostasis and Reproduce



Homeostasis



Internal Stability



Regulation



Reproduction



Genetic Information



Next Generation

HOMEOSTASIS IN ACTION

Temperature Regulation



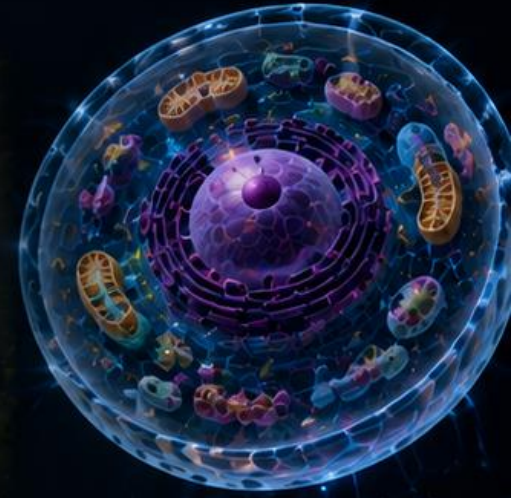
Water Balance



pH Balance



Nutrient Regulation



REPRODUCTION

Asexual (Bacteria)



Budding (Yeast)



Sexual (Flowering Plant)



DNA Passed to Offspring



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6 All Characteristics Work Together



Integration



All Characteristics Together



No Single Trait Is Enough



Fire

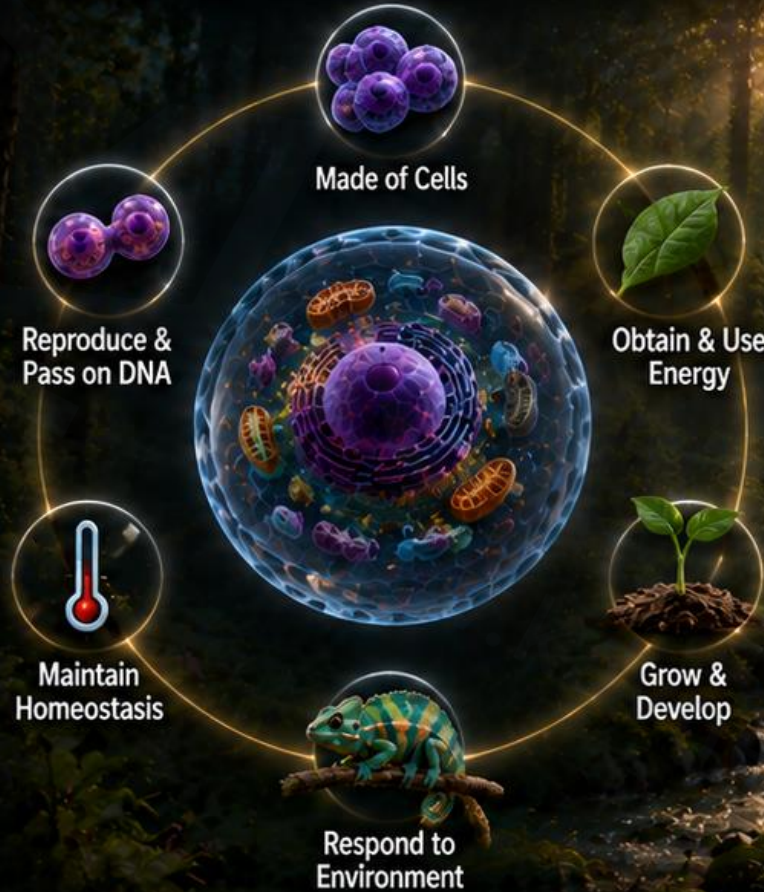


Crystals



Coordinated Life

LIVING SYSTEMS SHOW ALL CHARACTERISTICS TOGETHER



SCIENTISTS IDENTIFY LIFE BY CONSIDERING ALL CHARACTERISTICS TOGETHER.

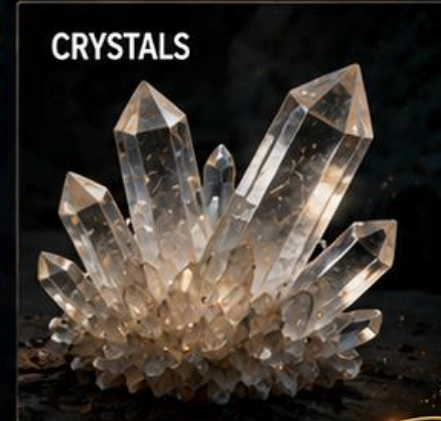
NOT ALIVE: MISSING THE FULL SET

FIRE



- ✓ Energy Use
- ✗ Made of Cells
- ✗ Growth & Development
- ✗ Response
- ✗ Homeostasis
- ✗ Reproduction
- ✗ Genetic Information

CRYSTALS



- ✓ Growth (Increase in Size)
- ✗ Made of Cells
- ✗ Energy Use
- ✗ Response
- ✗ Homeostasis
- ✗ Reproduction
- ✗ Genetic Information



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Summary



Made of Cells



Obtain & Use Energy



Grow & Develop



Respond to Environment



Maintain Homeostasis & Reproduce



Pass Genetic Info to Next Generation



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