

Lesson Summary

| # | Title | Pillar(s) | Description/Topic(s) | Periods |
|----|--------------------------------|-----------------------|--|---------|
| 01 | More on Data Structures | Data Structures | <ol style="list-style-type: none"> Useful list functions List comprehensions Sets Dictionaries Dictionary comprehensions Room Adventure...Reloaded Data structures summary | 2 |
| 02 | More on Objects | Computer Programming | <ol style="list-style-type: none"> Review of inheritance Abstraction and modularization Polymorphism and method lookup Multiple inheritance Abstract methods and abstract classes Coupling and cohesion | 4 |
| 03 | Building a Computer | Computer Architecture | <ol style="list-style-type: none"> Signed numbers (signed magnitude, one's complement, two's complement) Characters Floating point numbers Combinational circuits: decoders, encoders, multiplexers, and demultiplexers Sequential circuits: R-S flip-flops and clocked R-S flip-flops Building a simple computer | 5 |
| 04 | Problem Solving with Computers | Beam (Application #2) | <ol style="list-style-type: none"> The changing role of computers Communication-oriented applications Spreadsheets (including relative and absolute cell referencing, and replication and built-in functions) Solving problems with spreadsheets The Chaos Game spreadsheet | 1 |
| 05 | Software Engineering | Beam (Application #3) | <ol style="list-style-type: none"> Introduction to software engineering Analysis and design Documentation Prototyping Iterative software development Errors, error handling, exceptions, exception handling, and error recovery Testing and debugging Software engineering in action: the game of life | 1 |
| 06 | Algorithms...Reloaded | Algorithms, Computer | <ol style="list-style-type: none"> Introduction to Java A first Java program | 3 |

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|------------------|-------------------------|-----------------------|---|-----------|
| | | Programming | <ul style="list-style-type: none"> 3. Data types, constants, and variables 4. I/O, operators, and primary control constructs 5. Variable scope and program flow 6. Arrays 7. The foreach loop 8. The selection sort and binary search in Java 9. Laying out classes (Fraction...reloaded) 10. Inheritance, abstract classes and methods, and more (Shapes...reloaded) | |
| 07 | Artificial Intelligence | Beam (Application #4) | <ul style="list-style-type: none"> 1. Introduction to artificial intelligence (AI) 2. Can intelligent machines be constructed? 3. The Turing Test 4. A brief history of AI 5. Game playing and search techniques 6. Automated reasoning 7. Neural networks and machine learning | 1 |
| Pi Activities | | | | 3 |
| Final Pi Project | | | | 5 |
| Exams | | | | 3 |
| Housekeeping | | | | 1 |
| Slack | | | | 1 |
| TOTAL | | | | 30 |