# North Polk Community Schools Pacing & Course Description Guide

| **Grade Level: 9-12** | **Content:** COMPUTATIONAL SCIENCE | **Year: 2022-2023** |
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## Course Description/Rationale

The student will be introduced to modeling software and visualization with an introduction to the fortran 95 computer language. Study will include If-Then, For-Next, While Loops, Repeat-Until Loops, Read-Data, Arrays, Strings, Input, Sorts, and other programming commands. A background in Algebra 1 is recommended for students considering this course. (1 HS credit)

| Name of Unit | Time Frame | Essential Learning Target | Standard(s) |
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| Setting Up Your Account | Week 1 | I can set up my shoemaker account. | 3B-AP-10 Use and adapt classic algorithms to solve computational problems. |
| Boom | Week 1 | I can compile and run a fortran95 program. | 3B-AP-10 Use and adapt classic algorithms to solve computational problems. |
| Trace 1-8 | Week 1-2 | I can hand-trace a fortran95 program. | 3B-AP-15Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution |
| If Statement | Week 2-3 | I can use the if statement and the if-then-else statement in a fortran95 program. | 3B-AP-10 Use and adapt classic algorithms to solve computational |

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| | | | problems. |
| Base Two | Week 3-4 | I can convert base 2 to base 10. | 3B-AP-11 Evaluate algorithms in terms of their efficiency, correctness, and clarity. |

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| Project Temperature | Week 4-5 | I can write a program that has no user input. | 3B-AP-10 Use and adapt classic algorithms to solve computational problems. |
| While Loop | Week 5-6 | I can use a While loop(s). | 3B-AP-10 Use and adapt classic algorithms to solve computational problems. |
| Using Files | Week 6-7 | I can read and write from/to files and the screen. | 3B-AP-10 Use and adapt classic algorithms to solve computational problems. |
| Triangle Project | Week 7-8 | I can write a larger Program that uses a file. | 3B-AP-18 Explain security issues that might lead to compromised computer programs. |
| Dimension of 1 Array | Week 8-9 | I can work with Array(s). | 3B-AP-10 Use and adapt classic algorithms to solve computational problems. |

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| Dimension of 2 Array | Week 9-10 | I can work with Two Dimensional Array(s). | 3B-AP-15 Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution. |
| Random | Week 11-12 | I can use Random Numbers | 3B-AP-14 Construct solutions to problems using student-created components, such as procedures, modules and/or objects. |
| End of File | Week 13-14 | I can read an unknown amount from a file | 3B-AP-10 Use and adapt classic algorithms to solve computational problems. |
| Searching | Week 14-15 | I can read and search the contents of a file. | 3B-AP-10 Use and adapt classic algorithms to solve computational problems. |
| Sinking Sort | Week 15-16 | I can sort an array. | 3B-AP-11 Evaluate algorithms in terms of their efficiency, correctness, and clarity. |
| Binay Search | Week 16-17 | I can use Binary Search. | 3B-AP-11 Evaluate algorithms in |

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| | | | terms of their efficiency, correctness, and clarity. |
| Sub Programs | Week 17-18 | I can use Subroutines in Fortran95. | 3B-AP-11 Evaluate algorithms in terms of their efficiency, correctness, and clarity. |
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