LESSON

System Sizing

BIG IDEA(S)

Knowing the minimum and maximum number of modules in a PV is critical for performance.

TASK LIST SUBCATEGORY

415   Demonstrate knowledge of manufacturer specifications

405   Identify the factors related to system sizing and production

402   Select appropriate components to design a solar system

OVERVIEW

In this session, students will learn to identify the factors related to system sizing and production and by able to select appropriate components to design a solar system.

STANDARDS

PA/SDP

3.2.10.B4. Describe quantitatively the relationships between voltage, current, and resistance to electrical energy and power.

3.2.10.B6. Explain how behavior of matter and energy follow predictable patterns that are defined by laws.

INSTRUCTIONAL

TEXTS/REFERENCES

Solar Electric Handbook: Photovoltaic Fundamentals and Applications; Solar Energy International; Pearson 2013

MATERIALS NEEDED

Teacher Presentation: Presentation 400-5

Content: Chapter 6 and Chapter 13 of text

Technology: Access to Google sheets

IMPLEMENTATION (LESSON PLAN)

ENGAGE

- Ask students to list in their notebooks or on the board the pros and cons of 60 cell modules and 72 cell modules.

OBJECTIVES

Students will:

- Explain the importance of system sizing parameter
- Perform calculations using Ohms law for sizing strings

BRIGHT SOLAR FUTURES

☼ **SOLAR**

TOPIC OF STUDY

Solar Project Management and Design

🕐 **180 MINUTES**

KEY TERMS

series
PV source circuits
parallel
homeruns
PV output circuits

IMPLEMENTATION (LESSON PLAN) - CONTINUED

EXPLORE
- Teacher goes over powerpoint presentation 400-5.
- Students complete a string size calculator spreadsheet.

EXPLAIN
- As a whole class discuss the answers to the string size calculator spreadsheet.

EXTEND
- Review the Mayfield Energy PV String Size web site.
- Teacher provides parameters for new calculations.

EVALUATE
- Collect student work and provide feedback. Review areas of weakness or misunderstandings.

RESOURCES/LINKS

Calculating String Size
https://solardesignguide.com/calculating-string-size/

How to Calculate PV String Size
https://www.mayfield.energy/blog/pv-string-size

SolarEdge String Rules video
https://youtu.be/YP5ik77b_v4

String Sizing Guide
https://unboundsolar.com/blog/string-sizing-guide

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