# Worksheet #2: Black Rock Forest Electrical Energy Incidence versus Solar Energy Incidence
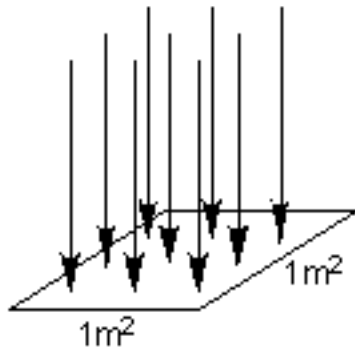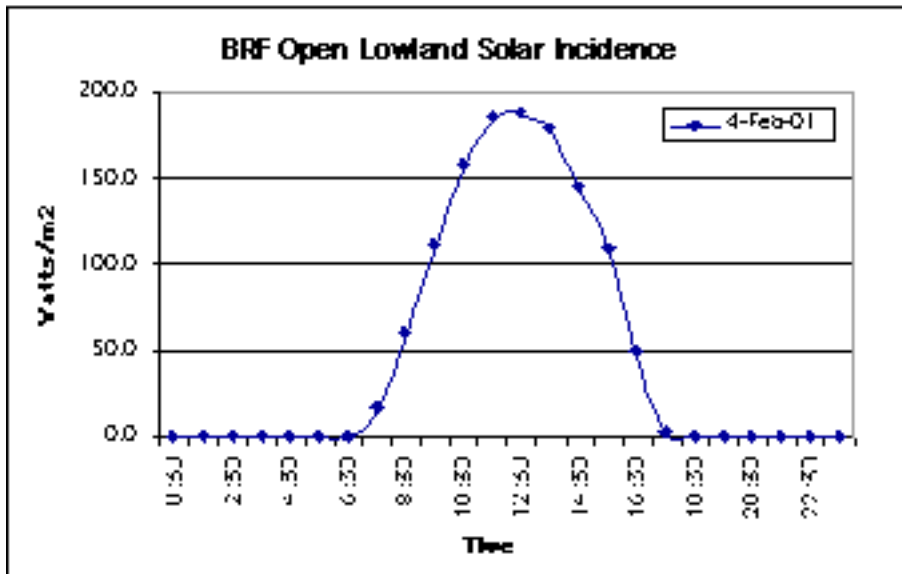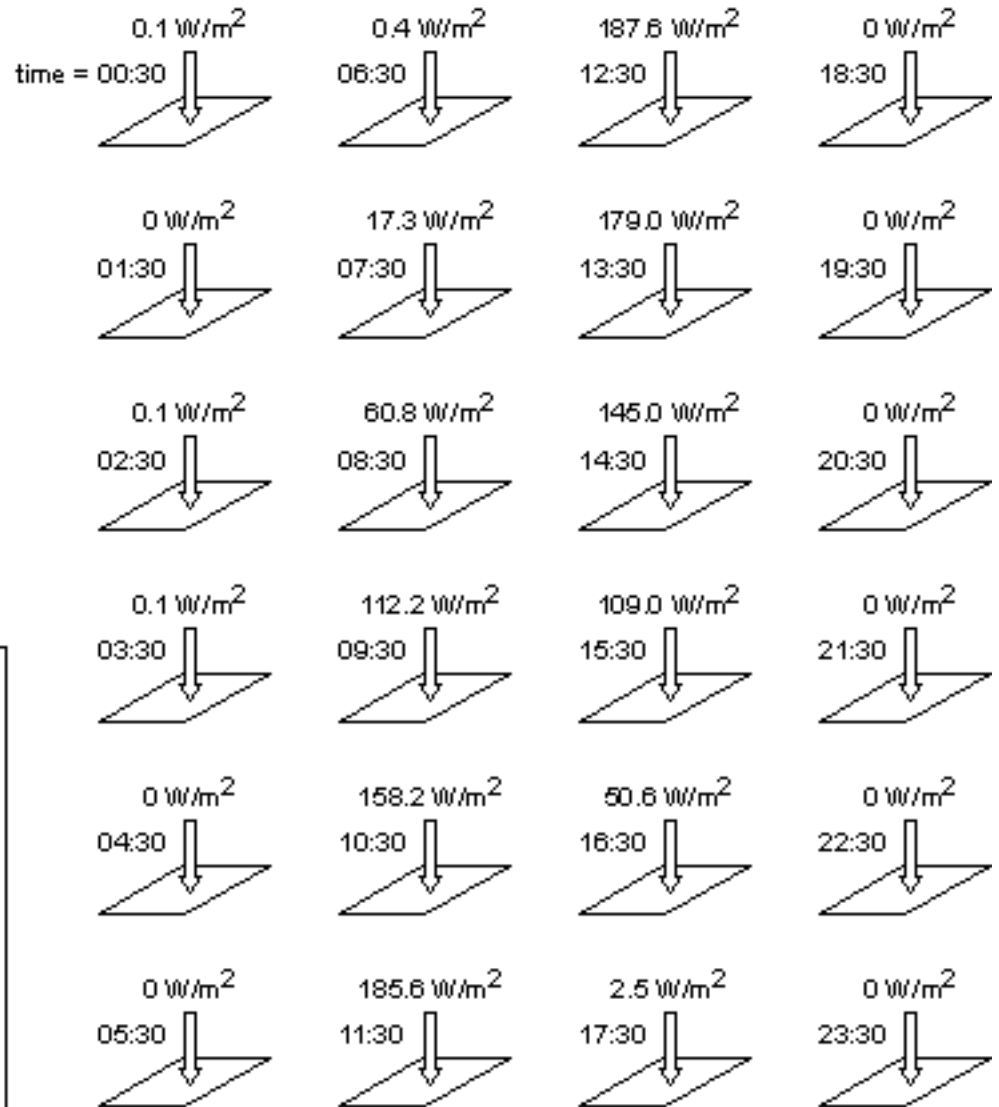
## Instantaneous Solar Incidence
## $(W/m^2)$



1m²

1m²

Rate of arrival of solar energy upon one square meter of Earth's surface. Varies from minute to minute as sun rises and sets, as clouds come and go.



## Average Daily Solar Incidence ($W/m^2$)
Rate of arrival of solar energy upon 1m² of Earth, averaged over 24 hours

| 0.1 W/m² | 0.4 W/m² | 187.6 W/m² | 0 W/m² |
|---|---|---|---|
| time = 00:30 | 06:30 | 12:30 | 18:30 |
| 0 W/m² | 17.3 W/m² | 179.0 W/m² | 0 W/m² |
| 01:30 | 07:30 | 13:30 | 19:30 |
| 0.1 W/m² | 60.8 W/m² | 145.0 W/m² | 0 W/m² |
| 02:30 | 08:30 | 14:30 | 20:30 |
| 0.1 W/m² | 112.2 W/m² | 109.0 W/m² | 0 W/m² |
| 03:30 | 09:30 | 15:30 | 21:30 |
| 0 W/m² | 158.2 W/m² | 50.6 W/m² | 0 W/m² |
| 04:30 | 10:30 | 16:30 | 22:30 |
| 0 W/m² | 185.6 W/m² | 2.5 W/m² | 0 W/m² |
| 05:30 | 11:30 | 17:30 | 23:30 |

Use a calculator to calculate the average daily solar incidence for this day: _____ W/m²

**Procedure:**

1. From the diagram, add all the watts of solar energy for the 24 hours of the day.

2. Find the average hourly rate.

3. Compare your answer to Column B (Average SI for Day) for February 4.

4. Look at the graph (above) and explain the curve.