

**2019 Year 11 Physics**

**Task 3: Investigation – Energy efficient Homes Validation Test**

Energy efficient homes

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. One way to passively cool a house is to have a breeze go through the house.
2. Two houses, one in Fremantle near the beach and one in Midland, both receive a breeze in the afternoon. Explain, with the aid of a diagram, why you would expect the breeze in Midland to be hotter than in Fremantle (4)

1. Explain how the layout and orientation of the house impacts the effectiveness of a breeze. (3)

1. Australian houses have very large roof cavities containing air. Air is a very poor conductor of heat energy. However, we use insulation bats, consisting of fibres and air pockets, in rooves to reduce heat loss from a roof.
2. Explain how roof insulation can contribute to efficient passive heating and cooling? (3)

1. Some insulation bats have a shiny, foil side. Using physics terms, describe how the foil side increases the insulation’s effectiveness. (2)

1. Why would a house in winter without insulation, lose significant amounts of heat through a roof, even though air is a very poor conductor of heat. (2)

1. How can installing a solar hot water system on a roof help lower the temperature inside a house? (3)

1. Describe a passive heating method that would help keep your house warmer in the wintertime. Explain the physics involved with the technology. (3)

1. Grass, near a house, can have a cooling effect on the home but synthetic grass can lead to increased temperatures in the house. With reference to heating and cooling, propose an explanation as to this difference. (4)

End of Test