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2. Is about the size of the earth
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What happens if a white dwarf has a nearby binary companion that tries to expand as it evolves?

1. Hydrogen may be pulled into an accretion disk around the white dwarf, then onto it
2. The hydrogen may have nuclear reactions and create a nova, as bright as 100,000 suns
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If the mass transferred to a white dwarf ever exceeds the limit 1.4 solar masses, what happens?

1. Carbon can begin to have very fast nuclear reactions
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2. Is about the size of a small town
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2. It would keep collapsing and nothing could stop it
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What happens near a black hole?

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3. Time and space are both distorted
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When the *Compton Gamma Ray Observatory* was launched in 1991 it showed that gamma ray bursts were coming uniformly from all over the sky. What does this tell us about the *source* of the gamma ray bursts?

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The radii of white dwarf stars in close binary systems gradually increases as they accrete matter.

1. Yes, their radii will slightly increase due to the extra material.
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2. Yes, neutron stars had been observed before at optical wavelengths but it was only after they were found to pulsate at radio wavelengths that astronomers realized their nature.
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1. Correct. Black holes do not emit light so they cannot be detected.
2. Correct. Such a low mass black hole would have no influence on the solar system unless it impacted a planet.
3. Incorrect. Such a black hole would measurably affect the orbits of the planets.
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We can detect black holes with X-ray telescopes because matter falling into a black hole emits X-rays after it smashes into the event horizon.

1. Yes, the energy of matter smashing into the event horizon is very high and creates strong X-ray emission.
2. No, after matter smashes into the event horizon, its radiation cannot escape.
3. No, black holes do not have surfaces for material to smash into. The X-ray emission comes from gas as it falls toward the event horizon and heats up.
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