# S.A.C.

# Students Against Crashes
# Instructor's Guide - Session Three

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| **PPT 1** | **Introduction:** Welcome the class back to session three of Students Against Crashes (SAC). [Have the student certificates filled out ahead of class. This way you can pass them out at the end of this session. The certificate master is in the "A- Introduction" folder.]<br><br>• Review the purpose, goals, and objectives for this program. Remind class of classroom rules and housekeeping rules.<br><br>• Review what you have covered up to this point. Preview what you will cover in the final session |
| **2-** | Review the data covered in session two outside with the test skids. Review the vehicle known speed, skidmark lengths, and guide the class through the process by writing each step on the board to calculate the drag factor.<br><br>**Better method**: review the computation process and formulawith the class. Ask each group to work together in their small teams to compute the drag factor based upon their measurements. Allow 1-2 minutes to do this. As time allows, ask a 'presenter' from one or two groups to present their calculation and conclusion. |
| **3** | Decide upon a single drag factor to use for today's excersize. Introduce the case study following this slide's bullet points. Ask the class to volunteer figures as you (or a pre-selected student/leader) write the numbers on the board. Have the class follow along using their notepads and calculators as they call out answers for each step of the process.<br><br>For example: if the drag factor is .5, then the formula will be $S = \sqrt{30Df}$ Under the square root symbol, the equation is (30)(200)(.5) which equals 3,000. Taking the square root of 3,000 is 54.77 mph. Demonstrating this to the class will assist those who don't quite have the grasp of the math process. |
| **4** | Introduce the concept of reaction/perception time.<br>**Background**- Years of study have demonstrated that it takes an average of .75 second to react to a stimulus (either braking or steering, or both). However, before reaction can occur, the driver must see a danger, perceive it to be a danger, and then trigger a motor response message to begin evasive action. The perception time average is also .75 seconds. Further study through the years concludes the combined perception/reaction time is about 1.6 seconds. |
| **5** | Once you have determined the initial minimum speed computed from skidmarks and crush formula, you apply this process to determine point of actual perception before braking began. The following slides illustrate this process. |
| **6** | To determine how far a vehicle traveled over a period of seconds, you must convert miles per hour to feet per second. There are 5,280 feet in a mile and 3600 seconds in an hour. Divide distance by time and you have the "conversion factor" which is 1.466 or 1.5 for classroom purposes. |
| **7** | For example, 50 mph is 75 feet per second (fps). Take half the speed in miles per |

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| | hour and add it back to the original speed. Now you have the conversion to feet per second. It is very easy to do in your head with round numbers such as 30, 40, 50, 60 mies per hour, etc. Advise the class this is a very easy way to impress your friends and perents. When you are in a car going 50 mph you can say to everyone in the car, "do you realize we are going 75 feet per second?" |
| **8** | This shows how to determine what the investigator calls "point of actual perception." That is the point in time and distance where the driver actually saw a danger and perceived it as a danger before actually beginning evasive action. Every accident has a point of actual perception. Just remind the class that it preceeds the beginning of skidmarks (braking or steering, or both), where the driver first saw a problem ahead. |
| **9** | Ask the class to work the problem. For a better learning experience, ask them to do it individually or in their small group. Then have one student or group demonstate the steps they used to determine the answer. Then review the process as you proceed through each slide.<br><br>If time does not allow, have the whole class work the problem together as you advance each slide. Ask for input for each step of the problem. Allow a student to call out the answer **before** you advance to the next slide. This inspires the class to think, calculate, and learn as you move through the problem steps. |
| **10** | The four challenges are set forth in this slide. Numbers three and four are extra credit as time allows. |
| **11** | Begin the math calculation one step at a time. Go slowly enough so that all can grasp the concept of what each letter stands for: f = drag factor, S = speed, D = distance. |
| **12** | Each slide progresses one step in the math process. This first slide inputs the numbers into the formula. |
| **13** | This slide does the first math calculation keeping the figures inside the fraction. |
| **14** | The final answer for the calculation is a four digit decimal. |
| **15** | For practical purposes, drag factors are usually rounded to the nearest hundredth (two decimals). |
| **16** | Step two plugs the known drag factor into the slide-to-stop formula. |
| **17** | Plug in the "known" quantities into the formula. |
| **18** | Calculate the multiplication under the square root symbol which is 3,669.6 |
| **19** | Push the square root button on the calculator to determine the minimum initial speed is 60.57 miles per hour. |
| **20** | Remind the class of the conversion process previously illustrated in slides 6-8. Use the 1.5 conversion factor and multiply that times 60.57 to equal 90.85 feet per second. Stress to the class how far 90 feet is (probably twice the length of the classroom. That is also the distance from home plate to first base. State emphatically that **this vehicle traveled that distance in only one second**. Count out for the class three or four seconds. At the end, say, how far did that vehicle travel during that time. This brings back to reality the actual speed of that vehicle. |
| **21** | Tell the class that we want to look at the **TOTAL** stopping distance a car needs from the first point in time that the driver sees a problem ahead. Stress that it is always much farther back before you first see the skidmarks.<br><br>Continually remind students and **make life applications to every day driving**. |

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| | Paint the picture of the typical rush hour traffic. Describe thousand of cars at 60 mph on the freeway with one car length distance between them. Ask the class, "Is it any wonder why we have 6 car chain-reaction rear-end collisions on the freeway?"<br><br>**Why do we use one car length per 10 miles per hour?** Because it is an easy way to remind drivers of safe stopping distance and an easy way to calculate that distance on a relative basis. |
| **22** | Crash avoidance by using safe driving habits goes hand in hand with safety equipment in your vehicle. One tool that has been in every car made since 1963, when it was required by fedaral law, is the seatbelt. Since that time, seatbelts have saves thousands of lives. Yet we still average only 50-80 per cent usage of seatbelts in our vehicles. The following video clip is a real-life crash where a person fell asleep at the wheel and ran off the road. The car lands on its roof and he is pinned in the right rear of the car. With seatbelts, he would still have been behind the wheel with little or no injury. |
| **23** | Show the clip. |
| **24** | Speed project #2 shows a study at a higher vehicle speed. |
| **25** | Same as before, this has a four part answer. |
| **26** | Illustrate the formula to be used. |
| **27** | Plug in the numbers. |
| **28** | Calculate the math within the fraction. |
| **29** | Divide the numerator by the denominator to achieve the final answer. |
| **30** | Reduce the answer to the nearest two digit decimal. |
| **31** | Use the slide-to-stop formula. |
| **32** | Plug in the numbers. |
| **33** | Calculate under the square root. |
| **34** | Determine minimum speed rounded to the nearest hundredth. |
| **35** | Use the conversion factor to determine feet per second. |
| **36** | Compute the total stopping distance. Again make the **application to everyday driving** where we don't leave enough space in front of our vehicle.<br><br>One example is **"closing the gap."** This is where we don't want any car to cut in front of us in heavy traffic so we keep the distance so tight in front of us that there is no room for another car to "cut in front" in that space. In doing so, we also "cut ourselves out" of any escape room when that car in front of us hits the brakes. We are out of room. This situation becomes worse when following a van, pickup, or sport utility vehicle. In that case, we can't see what other cars are doing ahead of our vehicle and our first warning is when we see that vehicle's brake lights. And then it is too late.<br><br>You can also appeal by absurd example. The total stopping distance for this vehicle speed was 325 feet. Ask the class, "Does one car length behind a vehicle at 61 mph equal 325 feet of stopping distance? Pause while the class snickers and makes a few comments. Then re-inforce that **it is speed and following too closely that cause the vast majority of crashes with young inexperienced drivers**. |
| **37** | **REVIEW THE COURSE**- Accidents are the #1 killer of YOUR age group. Statistics increase dramatically when two or more passengers are in the car with |

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| | you because of noise, conversation, peer pressure, and other distractions. There are more gadgets inside a car than ever before: cell phones, IPODs, drop downs DVD players, talking GPS systems, XM radios, ON-Star radio systems and more. This is in addition to the age-old distractions of food, beverage, radio tuning, and grooming issues.<br><br>Review each bullet point in the slide with the class. Stress that slowing down and allowing more room in front will save thousands of lives each year. Develop your own talking points. Encourage discussion within the class. Get them thinking about this subject and making individual applications. Many students may recall accidents they have been involved in as a driver or passenger. Continually challenge them with "how would a slower speed and increased following distance have helped this situation?" |
| **38** | **FURTHER REVIEW-** Ask the class, "How would you handle a situation where you are a passenger and the driver is speeding and following too close?" Allow them to make suggestions. You may want to write them on the board. Let them think for a moment of ideas. Be ready for some humorous replies.<br><br>When you are ready, click to advance the rest of the bullet points in the slide, one point at a time. **The last bullet is the conclusion** of the session. You may want to **pass out Completion Certificates** at this time (located in the "A-Introduction" folder). Congratulate the class on completion. Due to time constrainsts, you may need to end the session with this slide.<br><br>If you have another 10 minutes, advance to the next four slides. There are three video clips, with a total run time of about 8 minutes. You may or may not want to have discussion after them. They give a dramatic underscore of the safety theme of this presentation. |
| **39** | Introductory slide to the next three video clips. |
| **40** | "Heaven can Wait" is a powerful video image demonstating that seatbelts can mean the difference between life and death. |
| **41** | "Mission Impossible II." A video clip featuring Tom Cruise driving on dangerous mountain roads. It is a silly, entertaining clip. The editor points out some good driving tips on the left margin in real time. |
| **42** | "Parking lot Rage" demonstrates vividly how a trivial casual or careless event can cascade step-by-step into all-out war on the roadway (or parking lot). While humorous, this clearly demonstrates how each small step leads to the next bigger step. At any one point in the exchange, either party could have stopped the process by simply driving away.<br><br>Do not forget to pass out the **Certificates of Completion** if you've not already done so, and congratulate the class on completing the course. |
| **Contact us** | **GOOD LUCK with your presentation. We are always open to thoughts, ideas, suggestions, as well as questions. Please contact us at: dan.katt@rumpke.com** |