Synthesizing Ideas

Your research notes may have come from many different sources, but now you have to somehow **synthesize** them, or pull them together, into one paper—the one you're going to write. A great tool for synthesizing ideas is the **Inquiry Chart**. Here's how to build one:

1 Start with a Chart

Set up a chart like the one below. Once it's filled in, this chart will help you see how all the information you've gathered fits together and whether you've answered your research questions. Start by filling in the questions.

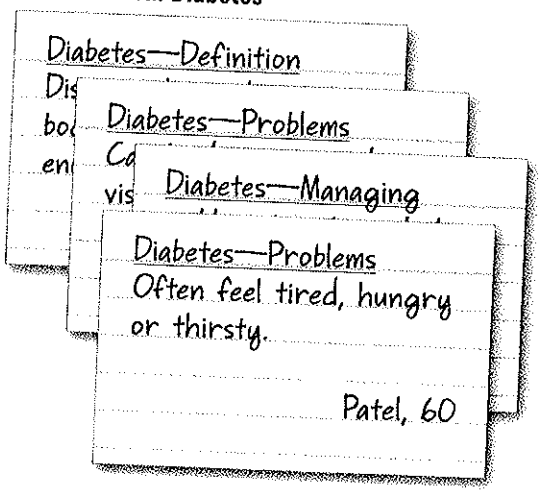
Research Questions	Source Information	Synthesis
What is it like to live with diabetes?		

Inquiry Chart

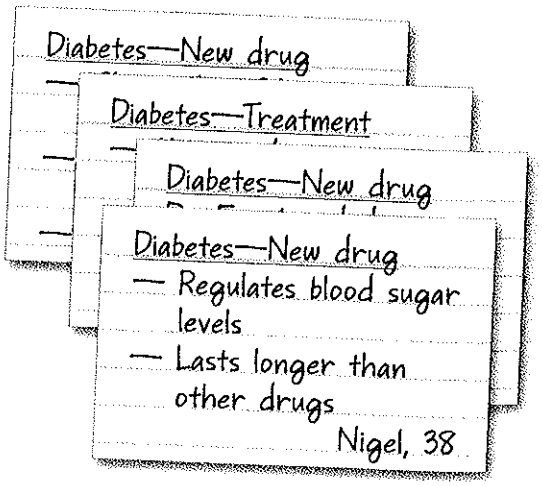
2 Group Note Cards by Related Ideas

Use the headings and keywords on your note cards to decide which cards should be grouped together.

Problems with Diabetes



Treating Diabetes



3 Fill In the Chart

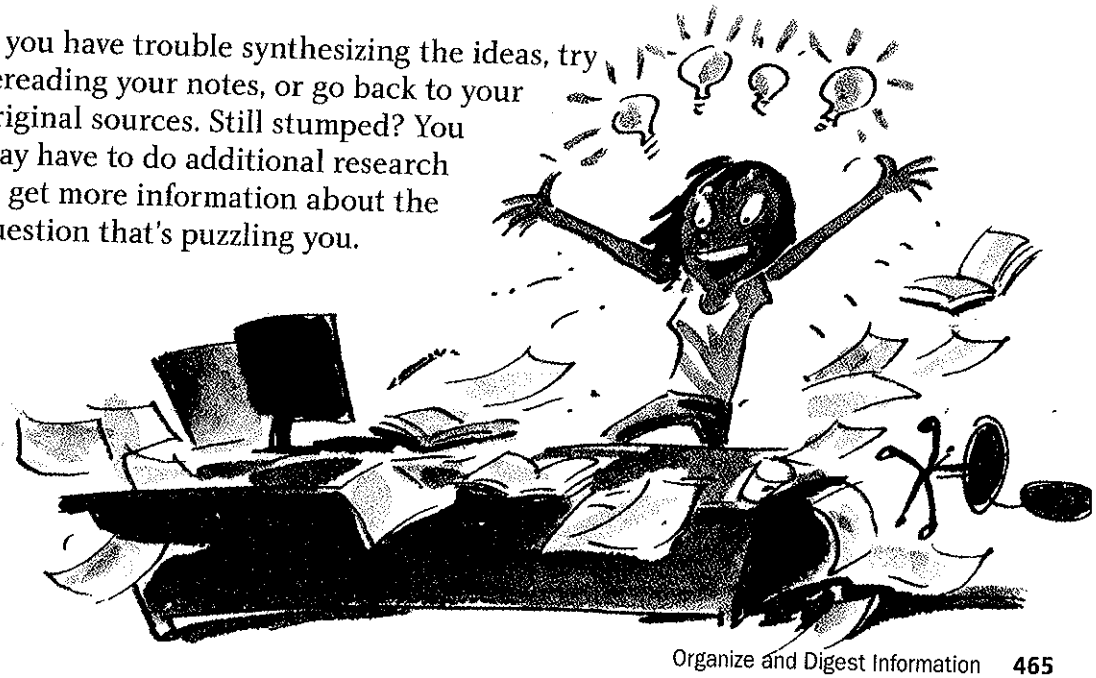
Using your grouped note cards, fill in the Inquiry Chart to get an organized overview of what you've learned.

To fill in the **Synthesis** column, review all the notes for a particular research question. What can you conclude from the information? Use your own words to write a statement that synthesizes the ideas.

Research Questions	Source Information	Synthesis
What is it like to live with diabetes?	Diabetics are often hungry or thirsty. (Patel 60) Diabetics have to check their blood sugar often. (Rocker 15) Diabetics live with medical problems like impaired vision, blindness, and kidney damage. (Nigel 35)	Living with diabetes can be difficult because of the daily symptoms, long-term health problems, as well as the need to check insulin levels frequently and to take medication.

Inquiry Chart

If you have trouble synthesizing the ideas, try rereading your notes, or go back to your original sources. Still stumped? You may have to do additional research to get more information about the question that's puzzling you.



Checking for Completeness and Focus

Before you move on to creating a formal outline for your report, take some time to check for

- completeness: Do you have all the information you need?
- focus: Is the information focused on your topic?

Not Enough Information

Take a hard look at your Inquiry Chart. Does it seem complete? Maybe you need to do additional research to answer some of your research questions more fully. Maybe, now that you know more about the topic, you can think of other interesting questions you want to research.

Inquiry Chart

Research Questions	Source Information	Synthesis
What are the treatments for diabetes?	Diabetics follow a special diet. (Patel 60) What is a good diet for diabetics? Can they eat sugar at all? Some diabetics take a daily insulin shot. Others take pills. (Nigel 35) Diabetic patients have mixed feelings about the new Gila monster treatment. (Morena 12) Find articles that include patients' responses.	

Too Much Information

Well, you can never really have too much information, but you want all the information you present to have a focus. Remember that not every note you take has to show up in your paper. Leave out information that

- doesn't relate to your research questions
- is contradicted by several other sources.

Inquiry Chart

Research Questions	Source Information	Synthesis
What is it like to live with diabetes?	Diabetics are often hungry or thirsty. (Patel 60)	
	~~Insulin was first used to treat diabetes in 1921. (Patel 59)~~	"This doesn't tell what it's like to live with diabetes, so I'll leave it out."
	Diabetics have to check their blood sugar often. (Rooker 15)	
	~~Check blood sugar three times a day. (Franklin 25)~~	"All the other sources say that diabetics check their blood sugar 'daily' or 'often'. This is the only one that says 'three times a day.' I can't verify this in another source, so I'd better leave it out."

Good researchers follow their "gut" as they pursue their research. So if you don't have enough information, or if the information isn't focused enough, think of additional questions, head back to the library or into the field.

Interviewing an expert on your topic is a valuable source of information. ▶

Packaging Your Ideas

What's It Like?

Presenting your research is like performing a complicated solo dance after you've finally mastered all the moves. You pull all the different pieces together to create a paper that is unique and all your own.

Make It New

"When I think about the Library of Congress, I'm inclined to jump in a lake. Who needs another book in the world, even one more sentence? That's how I begin my writing day: by understanding the audacity of what I'm undertaking. I'd better make sure I have something new to say, that's absolutely my own."

For a research report, you have gathered facts from other sources. Now you need to use them as ingredients to cook up something original.

- Use your outline to draft a well-organized report. Integrate the ideas from your sources and your own thinking into a coherent, original work.
- Cite your sources and acknowledge them, but don't let your research facts take over your work.
- Add visuals and sound for a multimedia presentation.

FOCUS POINT Look at the finished report on pages 471–475 to see how Anita integrated her research into an effective, original report. How is it organized? Does it match the outline on page 463?

Research Paper

A Reptile with the Power to Heal

Anita Hernandez

Could doctors use venom from a reptile to help treat a common disease? By studying a venomous lizard known as a Gila monster, researchers have been able to create a new drug to treat diabetes. The drug provides a convenient, effective alternative to traditional treatments for this disease.

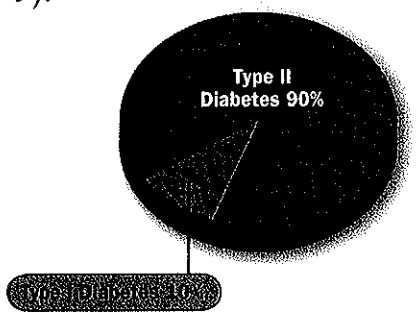
Introduction A thought-provoking question introduces the topic.

The writer then states the **thesis**.

Understanding Diabetes

Diabetes is a serious illness. Between 15 and 20 million people in the United States suffer from the disease (Michaels 16). Diabetes comes in two types. People with Type I diabetes (5–10% of sufferers) cannot produce insulin because an autoimmune disorder causes their bodies to destroy insulin-producing cells in the pancreas (Rocker, *Type I Diabetes*, 24–29). People with Type II diabetes cannot produce enough insulin and/or may not respond effectively to the insulin their bodies do produce (Hikel 179).

Body The writer uses **section headings** to organize the paper.



Research Paper, continued

Each main idea is supported by facts and details from the writer's research.

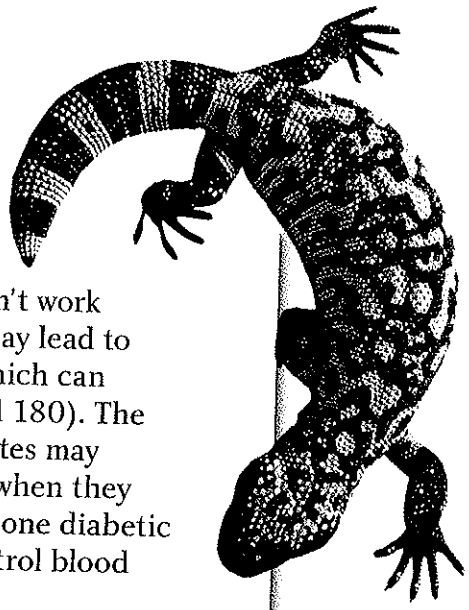
Why is insulin so important? When you eat, your body converts food to glucose, a simple sugar it can use for energy (Michaels 25). Normally, insulin helps cells absorb the glucose from the bloodstream, with the result that blood-sugar levels remain steady (Patel 59). Without insulin, however, or when the body does not respond effectively to insulin, cells cannot absorb glucose properly. The cells can't get the glucose they need from the blood, and blood-sugar levels may become dangerously high, leading to numerous medical problems (Rocker, *Beating Diabetes,* 15).

Since diabetics can't efficiently convert glucose into energy, they often feel fatigued and excessively hungry (Patel 60). More-serious health issues associated with diabetes include poor circulation, vision problems, unexplained weight loss, kidney damage, and increased risk of heart attack and stroke (Nigel 35).

Each section relates to the writer's thesis.

Managing Diabetes

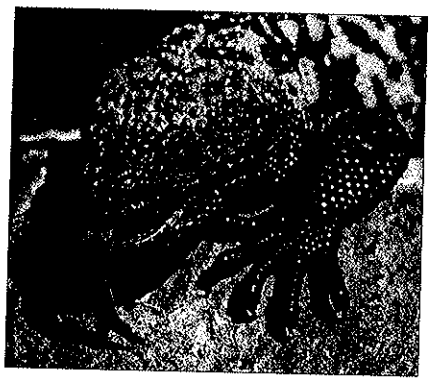
Most diabetics need to watch their blood-glucose levels and avoid foods that are high in sugar and fat. Regular exercise can also help, since it forces glucose to move through the body and into muscle cells (Morena 11). In addition, Type I diabetics usually also need daily insulin injections (Patel 65). Type II diabetics may also require medication—either insulin shots or drugs that stimulate increased insulin production in the pancreas (Rocker, *Beating Diabetes,* 20).



Traditional diabetes medications don't work perfectly. Injecting too much insulin may lead to a sudden drop in blood-sugar levels, which can cause a person to go into a coma (Hikel 180). The medications used to treat Type II diabetes may lower patients' blood-sugar levels even when they were previously normal (Hikel 180). As one diabetic explains, "It's extremely difficult to control blood sugar levels precisely" (Davidson).

Enter the Gila Monster

An unlikely hero, the Gila monster is a poisonous lizard with colorful skin and scales that look like beads. It is found in the southwestern United States and northwestern Mexico, where it hides in burrows for much of its short life (Sampson 23). The Gila monster's bite, while painful, is usually not fatal to humans (Ling 9). Researchers noticed, however, that people bitten by Gila monsters (like those bitten by other venomous reptiles) often developed an inflamed pancreas and—as a side effect—increased production of insulin (Hikel 179-180)!

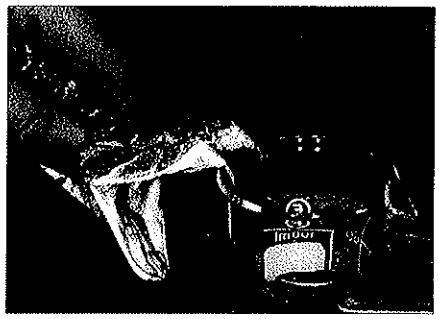


The Gila monster, a poisonous lizard

Photo adds visual information and enlivens the report.

Research Paper, continued

Medicine from a Monster



Snake venom is extracted in a lab, to be used for scientific research.

The writer cites **sources** for each fact included.

The new treatment was developed from the research of Dr. John Eng, who began studying the effects of animal venom on humans in the 1980s (Michaels 67). Dr. Eng analyzed Gila-monster venom and discovered that it contains a previously unidentified hormone he called exendin-4 (Morena 13). Exendin-4 is chemically very similar to a human hormone that triggers insulin release whenever blood-sugar levels get too high (Hikel 185). However, exendin-4 doesn't break down as quickly in the bloodstream as the natural human hormone (Smith et al. 25), making it more useful as a medication. Researchers have synthesized exendin-4 (which means it can be made in the laboratory, without having to use actual Gila monsters) and used it to make a new drug to treat Type II diabetes. The new drug, called exenatide, became available in 2005 (Fitzpatrick 70).

Exenatide has many advantages over older treatments for diabetes. Janet Swanson, a teacher from Ohio, was one of the first people to try out this new treatment. Previously, she had to monitor her

blood-glucose levels constantly, which interfered with her work. "Taking exenatide is much more convenient," she says (quoted in Barry 4). The drug remains in the body longer than other medications, so it doesn't have to be taken as often (Nigel 38).

Another advantage of exenatide is that it reduces appetite, often leading to weight loss (Sampson 27). This is helpful for the many diabetics who have difficulty managing their weight. Diabetic John Davidson remarks, "As a chef at a busy restaurant, I found it hard to stay at a healthy weight. But ever since I started taking exenatide, my appetite has been under control. In fact, I've lost 15 pounds."

Thanks to Dr. Eng's work, diabetics now have more options available than ever. Researchers are also looking into new medical treatments that use venom from sea snails and scorpions (Morena 14). Who knows what exciting developments are on the horizon?

Dr. John Eng discovered the Gila monster's power to heal.

Direct quotes help to make the paper lively and interesting.

Conclusion Relates ideas to the thesis and ends with a thought-provoking question.

Writing Your Report

Work from Your Outline

Your outline shows the framework of your thinking and provides the skeleton of your research paper. As you draft your paper, you'll put some meat on those bare bones. (And, of course, you can change your "skeleton" as you write.) Use your outline to:

1 Draft the introduction.

Get your readers interested from the beginning. Try one or more of these techniques:

- Show how your topic relates to your readers' experiences.
- Ask the question you will answer in your paper.
- Present an attention-getting fact, quotation, or anecdote.

Be sure your introduction also includes some background about your topic and a thesis statement that gives the main point of your paper.

2 Draft the body of your report.

Look at the sections with roman numerals in your outline. Turn each of those main points into one or more paragraphs.

3 Sum up your ideas in the conclusion.

In the final paragraph, relate your ideas to your thesis. Leave your reader with something to remember, such as a solution for a problem, a new question, or an interesting quote.

Revise, Edit, and Polish

Just like other kinds of writing, a research paper will need some revision and editing. Try to plan your schedule so that you can take a break for a day or so before you start revising. Look in the Revising and Editing sections in Chapter 1 (pages 50–77) for tips on how to create a great final draft.

Outline

A Reptile with the Power to Heal

I. Introduction—medicine from a monster

A. Gila-monster saliva used to create new diabetes drug

B. More effective in some ways than earlier treatments

A Reptile with the Power to Heal

Question

Could doctors use poisonous reptilian venom to help treat common diseases? Scientists are developing new medications based on their study of certain plants and animals. By studying the venom of a reptile called a Gila monster, researchers have created a new drug to treat diabetes. The drug provides a convenient, effective alternative to traditional treatments for this disease.

Thesis statement

Draft of the Introduction

Outline

IV. Description of Gila monster

A. Venomous lizard that lives in southwestern U.S. and northwestern Mexico

B. Side effects of its bite

The Gila monster is a poisonous lizard found in the Southwest. Its bite is very painful but usually not deadly. However, victims get a swollen pancreas and make more insulin!

Draft of Paragraph in the Body

Outline

VI. Conclusion

A. New ways to use plants and animals for medicine

B. Studying Gilas improved options for diabetics

C. Davidson example

Scientists are constantly looking at new ways that plants and animals can be used to cure our problems. Thanks to Dr. Eng's study of Gila-monster poison, diabetics have more options available than ever. John Davidson, who has diabetes, has started a support group to help others learn about the the new drug.

Draft of the Conclusion