

February 25, 2008

Talk to the Newsroom: Graphics Director Steve Duenes

Steve Duenes, graphics director for The Times, is answering reader questions Feb. 25-29, 2008.

Mr. Duenes manages the graphics department, a group of 30 journalists who research and create the diagrams, maps and charts for the newspaper and the Web site. He started at The Times in 1999 as the graphics editor for science. In 2001, he became the deputy graphics director, and in 2004, he became the graphics director.

Other editors have answered questions in this column, including Executive Editor Bill Keller, Managing Editor Jill Abramson, Managing Editor John Geddes, Assistant Managing Editor Glenn Kramon, Associate Managing Editor Charles Strum, Obituaries Editor Bill McDonald, Director of Copy Desks Merrill Perlman, Metropolitan Editor Joe Sexton, Living Editor Trish Hall, Investigations Editor Matthew Purdy, National Editor Suzanne Daley, Digital News Editor Jim Roberts and Culture Editor Sam Sifton. Their responses and those of other Times editors are on the [Talk to the Newsroom](#) page.

[These discussions](#) will continue in future weeks with other Times editors.

What Makes a Good Graphics Editor?

Q. I have a few questions for you. How did you get started in graphics as a career? Did you go to art school? What advice would you give to somebody looking to go back to school to get into graphics?

— Malia Cordel

Q. When you are interviewing a potential new graphic artist what are you looking for? what skills, or qualities?

— Andrew Haas

A. Maybe the best way to answer these questions is to focus less on me and more on the entire graphics department. There are about 30 of us, and we mostly do the same thing, but we specialize in different ways. There are graphics people here who have degrees or advanced degrees in

cartography, statistics, graphic design and journalism, and you can probably guess how their work is focused. But others have different backgrounds. For example, Jonathan Corum, our graphics editor for Science and one of our best designers, has a degree in East Asian Studies. Archie Tse, a senior editor and one of the most versatile visual journalists around, got his degree in Urban Studies, and Shan Carter, our terrific interactive designer, majored in Economics.

My point is that information graphics are not just art. They're a combination of art and journalism and a little bit of science. A background in art won't hurt. It helps if you can draw, but it's also important that you are a fast researcher, and you know the ins and outs of a variety of software packages or programming languages. You couldn't fill our department with technical illustrators alone and do the things we do.

Printed Graphics vs. Online Graphics

Q. I love the New York Times graphics, and look to the paper frequently for inspiration. I am an information designer at the General Accountability Office, which publishes printed and electronic reports for the U.S. Congress. We often struggle with the connection between printed and interactive information graphics ... specifically how to balance the different amount of information that an interactive graphic can contain compared to the printed version, all the while maintaining continuity between the printed and interactive product. Do you and your group struggle with this? If so, do you have any advice for organizations that are just beginning to publish in both media?

— Jess Cobert Smith, Washington

A. Good question. Clearly, we're publishing more data-driven graphics on the Web these days, so this comes up a lot.

When it comes to printed graphics, there are obvious (and less obvious) constraints on the amount of space we can devote to any single graphic. The obvious constraint is the physical size of the newspaper itself. The less obvious constraints are our beloved editors on the news desks who may not find a full-page flow chart as gorgeous and informative as we do!

Anyway, when we're dealing with a large set of data in the newspaper, our focus is mostly on finding interesting or important patterns in the data, and displaying those patterns succinctly. For example, in today's paper (Tuesday), you can find a large graphic about [the Democratic race in Texas](#).

In the lower right-hand corner of the graphic, there are little maps that show where the candidates have traveled in Texas as part of their campaigns. On the Web, we helped build [an application that tracks candidates](#) over a much longer period of time and across most of the country.

The data for the printed Texas graphic was extracted from the larger database that was set up for the interactive piece. In this case, it was pretty easy to decide how to edit the data for the paper. The piece was about recent activity in Texas, so that's what we showed. But we've heard comments about the interactive piece like — all that data is nice, but why don't you draw some conclusions? It's a fair point. The paper prevents us from showing all the data, so we try to edit intelligently and make points. On the Web, the temptation exists to publish more data simply because we have it. While we think readers will often find it interesting to explore a large set of data, we try to make it easily navigable. And lately, we've been paying close attention to the interactive device that sits on top of that large set of data. Often, it looks a lot like a newspaper graphic.

Before It Was Google Earth

Q. How integral is Google Earth as a tool in developing site plans and maps these days?

— Joseph Lengeling, New York

A. There are a number of sources we consult when we create maps. Some are old-fashioned paper maps; some are electronic databases. But Google Earth is pretty handy at times. The interface is intelligently designed, and as you know, the amount of data available is amazing. I wouldn't say Google Earth is a primary tool, but it's fair to say we've been fans of the program for a while, even before it was a Google product. About five years ago, Bill McNulty, a friend of ours who worked here at the time, started using an application called Keyhole that let users “fly” around and look at different kinds of imagery. Bill and Matt Ericson, who helps manage the department now, used that program and others to create very detailed, full-page maps showing the American advance into Iraq in 2003. We were really impressed by the program, and we were subscribers before it was bought by Google a few years ago.

Getting the Details Right

Q. What method do you use to assure information is readily available for detailed graphics of physical descriptions, for example, streets, buildings and such? Do you have photogs shoot so you can use true imagery as a starting point?

— Chris Rimel, Dyersburg, Tenn.

A. When we create diagrams, we keep a couple of things in mind. We want to be clear, and we don't want to invent anything. Maybe it's obvious what I mean when I say we want to be clear, but I'll elaborate a little. It means we want to eliminate superfluous detail, and we want to establish a clear visual hierarchy. So, if the story is about someone firing a gun in City Hall, we want readers to look at our diagram and quickly understand where the event occurred in the building, and

where the important players were when it happened. We have some extraordinary 3-D illustrators on the staff like Mika Gröndahl, Frank O'Connell and Graham Roberts, and they're more than capable of rendering every last detail of the ornate balcony in an old building like City Hall, but that's usually not the point. More often than not, a simple line drawing is the best solution.

Now, when I say that we don't want to invent anything, I mean we don't want to guess that a building was five stories tall. We don't want to assume that the staircase turned left, and we don't want to speculate about the color of the drapes. We have software that lets us create photo-realistic renderings, but it can be a problem if we don't know how everything was configured or what it looked like. This may seem like an obvious point, but back in 2003, when Saddam Hussein was captured, just about every news outlet did a diagram of his small hiding place, and not everyone got it right. It happens all the time.

We frequently work from building floorplans, photographs, satellite imagery, but as often as possible, graphics staff members go to the scene of a story to do their reporting. This happens most frequently with breaking news stories, and I can think of a few recent examples. Last November in Brooklyn, a young man was shot by police who said they believed he had a gun. It turned out that he had been holding a hairbrush. The next day, we knew a diagram of the location would be important, so Graham Roberts went out to the scene to make some sketches and take pictures. While he was there, another graphics editor in the office started to report some of the details that would let us reconstruct the event. In the end, Al Baker, a metro police reporter and frequent graphics collaborator, got ahold of police drawings that were extremely helpful. Graham came back to the office and created [the diagram](#) that appeared with this story.

Obviously, it's easier to travel to local stories, but we often send people to cover national and foreign stories as well. Archie Tse, whom I mentioned earlier, has gone to Iraq, Israel and Lebanon to report for graphics, and last April, when the scale of the Virginia Tech story became apparent, Farhana Hossain left her post as the graphics editor in our Washington Bureau and headed to Blacksburg, Va., with a number of other reporters.

The process behind that graphic helps describe the kind of journalism we strive for in the department. As the story was breaking, Amanda Cox, our statistics maven, did a quick computer "scrape" of the Virginia Tech Web site for faculty and student telephone numbers. Then she wrote another script to narrow the list of numbers, so we could try calling people who had classes in the building. Two other graphics editors, Amy Schoenfeld and Haeyoun Park, started trying to reach students and faculty. By using the phone lists and looking at social-networking Web sites, they tracked down sources who could explain the layout of the classrooms. Our goal was to reconstruct the sequence of events in a series of diagrams. Because floorplans of the main building were not available, we created a floorplan from scratch based on Haeyoun and Amy's interviews with scores

of professors, students and building workers. We were also able to create [a timeline](#) of the shootings from interviews with people who were there that day.

The Best Graphics

Q.What do you consider the best examples of NYTimes graphics? Can you give us an overview of the process required to develop these? I'm imagining significant input from, for example, statisticians, reporters, graphic designers.

— Jean W. Rosenthal

A.Our criteria for what makes a great graphic varies a little. There are things we attempt, and we hope the result will be spectacular, but we also think there's such a thing as daily graphic excellence.

It doesn't do us much good to produce a few splashy graphics but stumble on the smaller, routine things. If a reader can glance at a map or simple chart and quickly orient themselves or understand a statistic, and then continue reading the story without skipping a beat, it means we've edited and designed those graphics well. Several years ago, The Times's columnist, Nicholas Kristof sent a note about a simple graphic to a former colleague here. We still talk about it. Here's an excerpt:

From: Nicholas Kristof Subject: the power of art

in september i traveled with bill gates to africa to look at his work fighting aids there. while setting the trip up, it emerged that his initial interest in giving pots of money to fight disease had arisen after he and melinda read a two-part series of articles i did on third world disease in January 1997. until then, their plan had been to give money mainly to get countries wired and full of computers.

bill and melinda recently reread those pieces, and said that it was the second piece in the series, about bad water and diarrhea killing millions of kids a year, that really got them thinking of public health. Great! I was really proud of this impact that my worldwide reporting and 3,500-word article had had. But then bill confessed that actually it wasn't the article itself that had grabbed him so much -- it was the graphic. It was just a two column, inside graphic, very simple, listing third world health problems and how many people they kill. but he remembered it after all those years and said that it was the single thing that got him redirected toward public health.

No graphic in human history has saved so many lives in africa and asia.

I'm sending you a copy of the story and graphic by interoffice mail. whoever did the graphic should take a bow.

nick kristof

The person who took the bow is Jim Perry, a veteran graphics editor who has produced a long list of consistently good graphics since he started here 1980. The process required to develop a good graphic revolves first and foremost around the quality of the information, followed by finding ways to organize the information clearly.

As you might assume, there are a few larger Times graphics that we like. I think the paper has a strong history of graphics, and there are outstanding examples from the past like the charts that accompanied the 1969 moon landing coverage and the terrific diagrams done in the wake of the 1993 World Trade Center bombing. More recently, I think the desk did pretty well covering the national census in 2001, the aftermath of September 11th, the 2004 general election and Hurricane Katrina. There have been some solid interactive graphics in the past year, and since we're getting a quite a few requests for a list, I'll see if I can put something together.

Influences on New York Times Graphics

Q. New York Times graphics are always way ahead of the pack in the way they communicate complex data clearly and intuitively. Are you a fan of Edward Tufte?

— Anthony Athens

Q. How influenced are you and your staff by Tufte's "The Visual Display of Quantitative Information"?

— Bill Craven

A. A number of people have asked about the influence of [Edward Tufte](#), and you specifically mention, "The Visual Display of Quantitative Information," which I think is his best book.

For those who are unfamiliar with Mr. Tufte, he's a former professor at Yale, and his books and presentations are well known in the design community. He has written authoritatively about the presentation of data, and about the importance of exposing the richness of quantitative information by eliminating distracting design ornamentation.

I don't want to get too deep into this because I don't think this discussion should be for the designers alone, but influences are an interesting subject, and it's safe to say that Mr. Tufte's work

is an influence here. Everyone on the staff here is familiar with his thinking, and one of us was a student of his at Yale. Every now and then he'll compliment one of our graphics on his Web site, and to be honest, it tends to bring a smile.

But there are all kinds of influences on the graphics desk, and many of them lie closer to home. After the Columbia shuttle disaster in 2003, we looked back at the 1986 coverage of the Challenger explosion. We found some terrific ideas that we could adapt, and many of those ideas came from our current boss, Associate Managing Editor Tom Bodkin. There have been other graphics editors here whose excellent contributions still give us ideas. Most recently, my predecessor in this job, Charles Blow, was a huge proponent of exploring new visual forms, and he was the rare designer who could shape lofty, and sometimes fuzzy ideals into brilliantly executed figures, which still give us food for thought.

There are other contemporary graphics specialists who have influence here, including [John Grimwade](#), who started at The London Times and now works at Condé Nast. John has produced terrific diagrams for travel stories along with other gems. And there's [Nigel Holmes](#), who spent a long time at Time magazine. His graphics are infused with wit, and he brings a sense of humor to what might otherwise be a clinical field of statistical figures. There are computer scientists like [Ben Shneiderman](#) at the University of Maryland and [Martin Wattenberg](#) at IBM whose visualizations and interactive applications have set an extremely high bar for data-rich presentations.

And there are older sources of influence and inspiration like the graphics done in Fortune magazine in the 1940's, and "[Powers of Ten](#)," a short film by Charles and Ray Eames probably influences every New York Times map that adjusts its scale to zoom in. Of course, there are other artists whose work may not be tied to statistical data, but who take imaginative leaps with maps, grids, color and connections, and they exert a little pull. [Saul Steinberg](#), [Sol LeWitt](#) and Mark Lombardi come to mind, but there are others.

Obviously, I've weighted this list according to some of my own preferences, and some of the people on the list have been the subjects of discussions I've had with staff members, but everyone here brings their own influences into the mix. One of the things I like most about this place is the way ideas thread their way through the desk. Often, someone in the department, like Matt Ericson (source of more innovation here than I can describe), will invent some new model. And then someone else will see it and ask him how he did it, and they'll adapt it. And then someone else will tweak it again and reuse it and pretty soon the form has morphed three times and then it's a new standard for how we do things.

Working in Print and Online

Q. In some newspapers' newsroom, they have different people to do interactive graphics, which means the artists of the graphics department mainly do print graphics. How about The Times's graphics department? Does the same person do both print and interactive versions of graphics? Does the digital department do interactive graphics? How does the graphics department work with them?

— Ji Qi

Q. The quality and innovation in the information graphics in The New York Times, both online and in print, is really quite astounding — and indeed seems peerless among publications. How are new kinds of information graphics developed? Can you shed any light onto your department's creative process?

— C. Goodman-Strauss

A. Producing a newspaper graphic at The Times is different than producing an interactive graphic.

Print newspaper graphics are produced solely by the graphics desk, and the structure of the department that had been in place until a couple of years ago existed so we could respond to news and produce work for a print product.

Interactive graphics are a different story. Awhile back, our executive editor, Bill Keller, sort of fired a gun to initiate a newsroom-wide integration between the print and Web newsrooms, and we took it as an opportunity to reconfigure ourselves so we could generate the same level of work on the Web that we produce, or aspired to produce, in the printed paper.

Before the graphics desk had its act together on the Web, there were a couple of Web producers who regularly published terrific graphic work. Ben Werschkul and Geoff McGhee had to cover a lot of ground because they frequently worked alone, and they did it extremely well. But it was clear that the entire graphics department needed to catch up.

Getting started, it didn't hurt that about half of the department had Web experience. Many of us had come from Web sites only to join a department that was focused on printed work. But that was about to change. We tweaked our schedules and added some new faces, and by 2006, we were in a position to aggressively pursue news stories in a way that played to our strengths. The first test probably came when a small plane crashed into an apartment building on Manhattan's Upper East Side. Here's the [graphic](#).

Since then, we've grown and changed our routines, and now we don't really think of ourselves as a print graphics department. We think of ourselves as a desk that can produce graphics for whichever platform makes sense. Here are some of the results:

- An interactive piece [assessing the "surge" in Baghdad](#).
- A look at [Barry Bonds's home run record](#).
- A critique of the [New York Times tower](#).

In this endeavor, we're not alone. Developing deep interactive features often means joining hands with a couple of other departments whose staff members have extensive specialized skills. One new group in the newsroom, the interactive news technology department, is a group of talented software developers who sit nearby and focus their efforts on projects that require significant programming expertise. Two recent collaborative projects with this group were our [guide to where presidential candidates stand on the issues](#) and our [election results pages](#).

On other kinds of projects, we get together with the multimedia department. Andrew Devigal manages the group, and I asked him if he could talk a little bit about what they do. Here's Andrew:

The multimedia department, like graphics, has staff members with a variety of experience that ranges from advanced degrees in computer science to several years' worth of work in public radio. By collaborating with many departments in the newsroom, especially the graphics department, we've been able to produce media-rich narratives and experiences. For example, Gabriel Dance worked with the graphics and video departments to produce [The Met's New Greek and Roman Galleries](#). The package offers an immersive experience that includes photographic panoramas and a tour of the galleries with [Michael Kimmelman](#), a Times art critic. Our department also develops tools to help readers visualize complex sets of information. Senior multimedia producer Tom Jackson collaborated with Archie Tse to design the "[Is It Better to Buy or Rent?](#)" interactive.

Guidelines for Visual Communication

Q. Could you summarize what you consider the most important guidelines in effective visual communication? And could you provide us a gallery of diagrams/maps/charts that illustrate your guidelines?

— Dick Purcell, Boulder, Colo.

A. I mentioned earlier that I'd try to assemble a list of New York Times graphics that we're mostly happy with. I say mostly because we haven't created any perfect graphics, but this assemblage represents many of the strengths of the department. To gather the list, I asked my colleagues in the department (and other departments) to contribute graphics they liked as well as a description of the process. Here goes:

Erin Aigner, a graphics editor and cartographer, talks about [an interactive trip up Mt. Kilimanjaro](#):

For our animation of Tom Bissell's climb up Mt. Kilimanjaro, we wanted to give the reader a panoramic view of the mountain and a sense of the scale of his weeklong journey. To make an accurate model of the mountain, I used digital elevation data to create a 3-D model. Then I traced the climbers' route onto a satellite image of the mountain, which I draped over the model so that the different types of land cover

looked realistic. After the model was created, I used software that allows you to control environmental elements like light and clouds to create a fly-through movie. My colleague, Vu Nguyen, designed the interface and integrated all the elements in Flash.

Jonathan Corum, science graphics editor, describes his graphic ([print version](#) and [Web version](#)) covering the presidential debates:

One recent example of a graphic that used a range of tools as part of the creative process was the "String of Debates" graphic, part of which was expanded online as the "Naming Names" interactive feature. The graphic showed word usage among major presidential candidates across a series of debates, and used a set of circles to indicate when candidates spoke the last name of another candidate.

Work on the project ranged from extremely tedious (hours of scripting and combing through debate transcripts to separate the different candidates) to extremely interesting (learning a new software package to produce the desired chart).

The circle design was created with an impressive piece of software called [Circos](#), which was originally built to visualize genomic data. To make it work I had to encode the entire series of debates as if it was a genome. So each presidential candidate was a chromosome, and each debate was a chromosome band, and each spoken word was a nucleotide. It sounds a bit ridiculous, but that was all behind the scenes. The end result is a fairly simple interactive graphic, but hopefully one that caught the eye and allowed readers to find patterns across the long series of debates.

Amanda Cox, a graphics editor, describes interactive graphics she worked on that show box office revenues and the price of oil:

Two of my favorite graphics so far this year involve borrowing visual forms. The first shows [the box office revenue and timing of individual films](#). In preparation for the Oscars a year ago, I did a quick Google Scholar search, and one thread was about how more people go to see films that are nominated for awards. I gathered enough data so we could look at this empirically, but we ended up pursuing [a different idea](#) and I moved the box office data to an "ideas" folder in the depths of my computer. A few weeks ago, I met Lee Byron, an undergraduate at Carnegie Mellon, and he showed me work that he had done using a somewhat novel form to look at [his personal music listening history](#). It seemed like a fun way to go this year, especially online, where we were able to let readers discover patterns about films they had seen since the late 1980's.

The other graphic looks at [oil prices and consumption](#) in a way that's a little odd, but also very informative. I had seen a chart like this in an oil industry journal from the 1980's, and also in a publication by the Rocky Mountain Institute, a nonprofit energy research group. I thought it was brilliant, but the tricky part for us was making it accessible for a broader audience. Jad Mouawad, a business reporter who covers the energy industry, graciously helped out with the audio tour.

Gabriel Dance, a senior producer in the multimedia department, describes his development of a piece that displays [the photos of the American soldiers who have been killed in Iraq](#):

"Faces of the Dead" was a design challenge on several fronts. The interface needed to be simple, but readers needed to be able to see the faces, and they needed to be able to search for individual soldiers, either by name or location. On top of that, I really wanted to encourage readers to stay with the piece for a few minutes, so they could fully absorb both the images and the detailed information.

I went through several revisions and felt it was important that the faces and a count of the total number of casualties be present on the screen at the same time, and it was difficult to determine how to do that. While working on the project, I picked up a design magazine for inspiration, and I saw an illustration with a scantron sheet — like the ones we filled out in grade school for standardized tests — that had an image of a face made up of the little, filled-in bubbles. Something clicked. The scantron bubbles turned into pixels, and each pixel would represent one soldier. This made it possible to get all 3,000 soldiers on the screen at one time. It also made it possible for people to see a new image simply by clicking on any pixel, which

encouraged further interaction.

Shan Carter, a graphics editor and interactive designer, talks about how breaking news graphics come together:

Producing in-depth, explanatory graphics in response to breaking news is nearly impossible for one person. When news breaks, our entire team comes together, and each person focuses on one aspect of the graphic. Six people are credited for [the crash graphic](#). Some are reporters who can track down floorplans or talk to witnesses; others are skilled illustrators who can accurately render an entire building in a few hours; my job is usually to bring all the information and illustrations together into an animated narrative for the Web.

Matthew Ericson, the deputy graphics director, talks about a graphic that sorts out [court rulings on detainee cases](#):

It's not the sexiest graphic, but one of my favorite graphics from 2006 was a large timeline we did when the Supreme Court ruled for the fourth time on the issue of Guantánamo Bay detainees. The four cases had a pretty long legal history, with cases filed, and appeals filed, and more appeals filed. I had a hard time keeping the cases straight myself, so I figured there had to be a few readers out there who were confused. Farhana Hossain, our graphics editor in the Washington bureau, started researching the history of the cases and compiling a chronology not only of court decisions in the cases, but also of actions the Bush administration had taken in response to them. The court announced the Hamdan v. Rumsfeld decision the next day, and we quickly began sketching out how we wanted to arrange the graphic. Over the course of the day, we edited the text to fit the space available, filled in some missing pieces of information, ran it by our terrific legal correspondents, and we had it on the page by about 9 p.m., in time for our first edition.

Dylan McClain, a business graphics editor, on [a two-page print graphic describing the declining dollar, in 1995](#):

The basic idea was pretty straightforward, but producing the graphic itself was difficult. The data was captured on a Friday evening, and then I went in early Sunday morning to begin plotting it. I had to sift through each and every data point (there were more than 2,000 for both the mark and the yen) and space them out according to when each trade occurred. It took me the entire day. The other charts had already been produced and put onto the pages. I recall that I finished up the mark and yen charts about an hour before deadline. Now, of course, it would be much easier.

Amy Schoenfeld, a business graphics editor describes a feature about [Super Bowl advertising](#):

With several weeks to go before the 2007 Super Bowl, we started thinking — has anyone kept track of Super Bowl ads over the years? We found a research group that had and used their historical database to look at trends. Did Budweiser really advertise every year? Was humor always a strategy? We plotted and re-plotted the charts for the print version, but felt they lacked what we were most excited about — the actual ads. So we set up the page like a playbook, organizing strategies on either side of the main chart to highlight some of the most popular and unusual ads. For the Web version, we used the charts to link to the actual commercials. We collected these from ad agencies over a couple of weeks (the research group had the ads only on VHS tapes). We set up the interactive with a timeline slider that allowed users to scroll through two decades of data and ads. This design allows us to update the project each year.

Archie Tse, a senior graphics editor, talks about [a print graphic he researched while he was in Iraq](#):

I was interviewing a Sunni family in their Baghdad apartment when Saddam Hussein's capture was announced on the television. Almost immediately the sound of gunfire erupted across the city as Iraqis reacted to the news. I went to the Green Zone to cover the news conference where they provided details on how Saddam had been found.

That evening, we found out that the military would give a tour of the site to the press the next morning. So after just a couple of hours of sleep, five members of the Times Baghdad bureau, two reporters, a photographer, a translator and I woke up early to make the drive to a military base in Tikrit. From there, we were flown in helicopters to Ad-Dawr, a small village along the Tigris. We walked a short distance to a farmer's shack. The spider hole was off to the side of the courtyard in front of the shack.

I paced out the dimensions of the courtyard and the interior of the shack and made numerous sketches of the spatial relationships between the structures. They let each of us go down into the spider hole. The layout of the hole, which I thought was one of the most important details, was more like a "T" than an "L." I transmitted my sketches back to the graphics department in New York, where two of my colleagues created a 3-D diagram of the compound for the next day's paper.

Joe Ward, sports graphics editor, talks about his analysis of [the technique employed by the United States sprinter Lauren Williams](#):

One of the things I find most satisfying about sports graphics is the opportunity to dissect seemingly simple athletic movements. Lauren Williams is simply running 100 meters. But when her stride, her pace, her body angle and her leg angles are all broken down by the scientists who study them, the difference between these athletes and the rest of us becomes really clear.

Karl Russell, a business graphics editor, talks about a 12-column, print graphic about [two days of global market turmoil](#):

Early in the day we had a meeting, and the news justified going big. We decided to show market performance in 10 countries and have the charts stretch across two pages. We wanted to chart intra-day stock movement (which would walk readers through the events minute by minute) and a long-term trend for context. Also, since we work closely with photo editors, we knew there were lots of good pictures of trading floors, a perfect fit. This graphic was a group effort — a team of four people downloaded data, created charts, reported the descriptions and chose photos. I was responsible for the overall composition.

Mika Gröndahl, a graphics editor and illustrator, talks about his [diagram of a centrifuge for the print version of Science Times](#):

The centrifuge graphic is a classic example of how reporters and graphics editors work together. To gather the reference material, I spoke with sources the reporter had cultivated over the years. Then I made a sketch and refined it. I created a 3-D model and made revisions until we were satisfied with the level of detail and clarity.

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